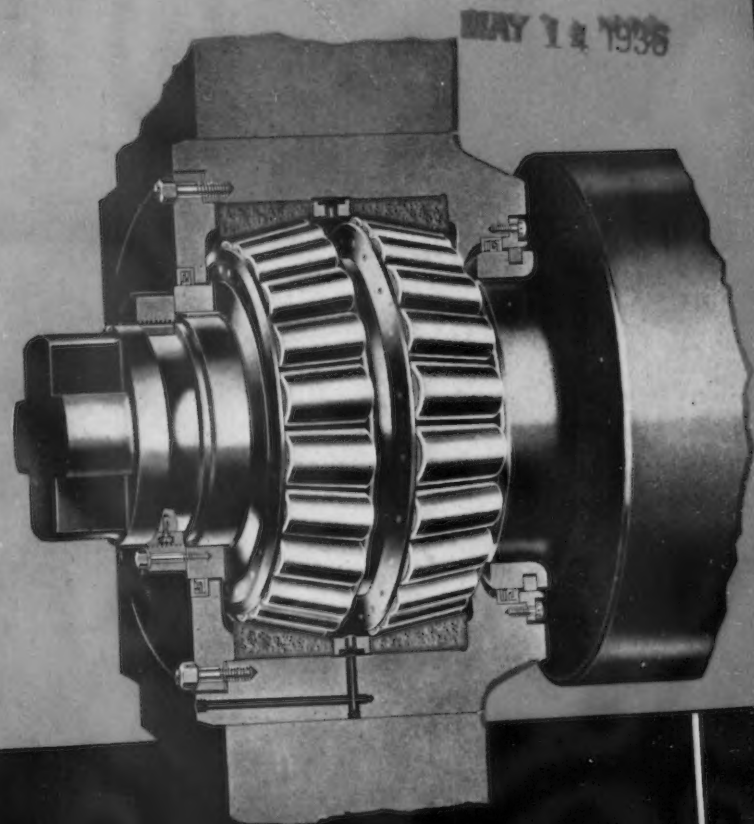


# THE IRON AGE

MAY 14, 1936



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- 1 An overwhelming majority of the most important rolling mills built in recent years have gone on Timken Roll Neck Bearings.
- 2 The largest anti-frictionized 4-high sheet and strip mills ever built—hot and cold—are equipped with Timken Roll Neck Bearings.
- 3 Timken Roll Neck Bearings have rolled more steel per bearing than any other type of anti-friction bearing ever used on mill roll necks.
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- 6 The largest capacity anti-friction roll neck bearings ever built are Timkens.

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COMPANY, CANTON, OHIO

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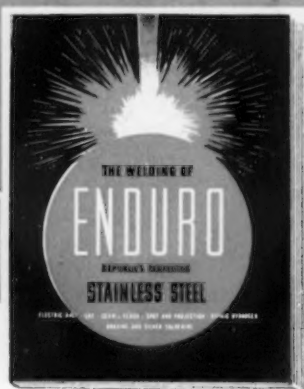
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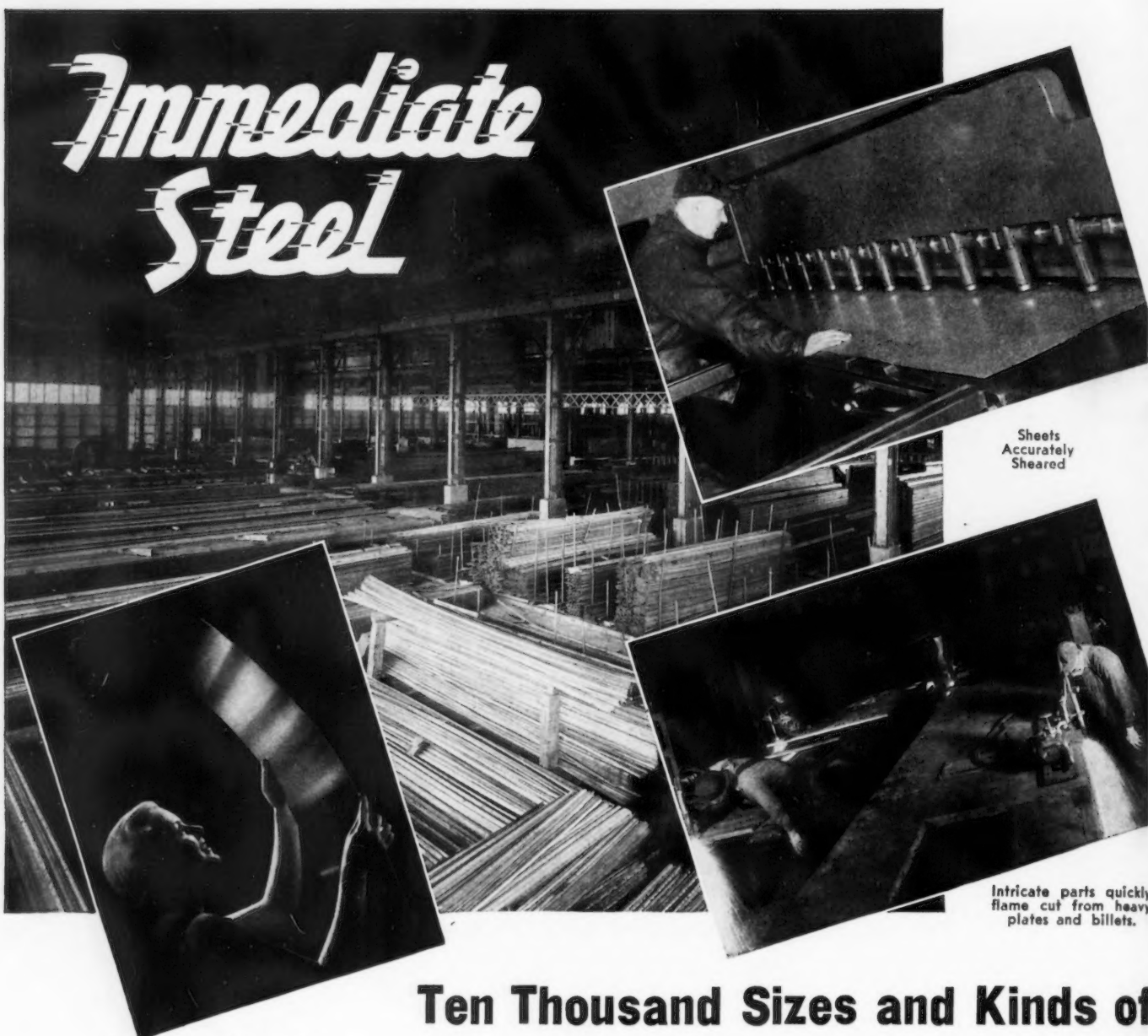
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# ▲▲▲ THE IRON AGE ▲▲▲

MAY 14, 1936

ESTABLISHED 1855

Vol. 136, No. 20

## *The Fool-Proof Machine . . . .*

ONCE upon a time there was a remarkable machine.

Materials were put in at one end of it and out from the other end came all sorts of things that people needed—shoes, automobiles, houses, clothing, food and what else have you.

The machine was not perfect; it had one defect that even the most skilled mechanics could not overcome. It would not run at constant speed. It would slow down in bad weather and speed up when the sun shone. But it never stopped. It had run for more than three-quarters of a century, turning out things for people in marvelous quantities.

Of course the machine had its critics; mostly people who knew very little about how it operated and who had had little or nothing to do with either building or running it. No one paid much attention to these critics, however, until the great rainy period set in.

It rained and rained and rained. The machine, sensitive to weather conditions, slowed down. It didn't stop but it got down to something better than half speed, and its output shrank proportionately. People began to grumble.

This gave the critics a golden opportunity. "Put us in charge of this machine," said they, "and we will show you some real results. We will modernize this old fashioned contraption, regularize it, discard a lot of old parts and put in new ones of our own design. You won't know it when we get through with it."

The people, discontented with the output of the machine, accepted the proposal of the critics and put them in charge, headed by one known as "The Great Experimenter."

Acting upon this principle, this motley crew did strange things to the machine. They added unheard-of attachments, each of which was advertised as a miracle worker but none of which did anything except to handicap the mechanism. They even tried changing the color of the machine from battleship gray to red.

As fast as these attachments were put on they would fall apart or be shaken to pieces by the machine, which kept right on going in spite of these handicaps. It was what you might call a "fool-proof" machine.

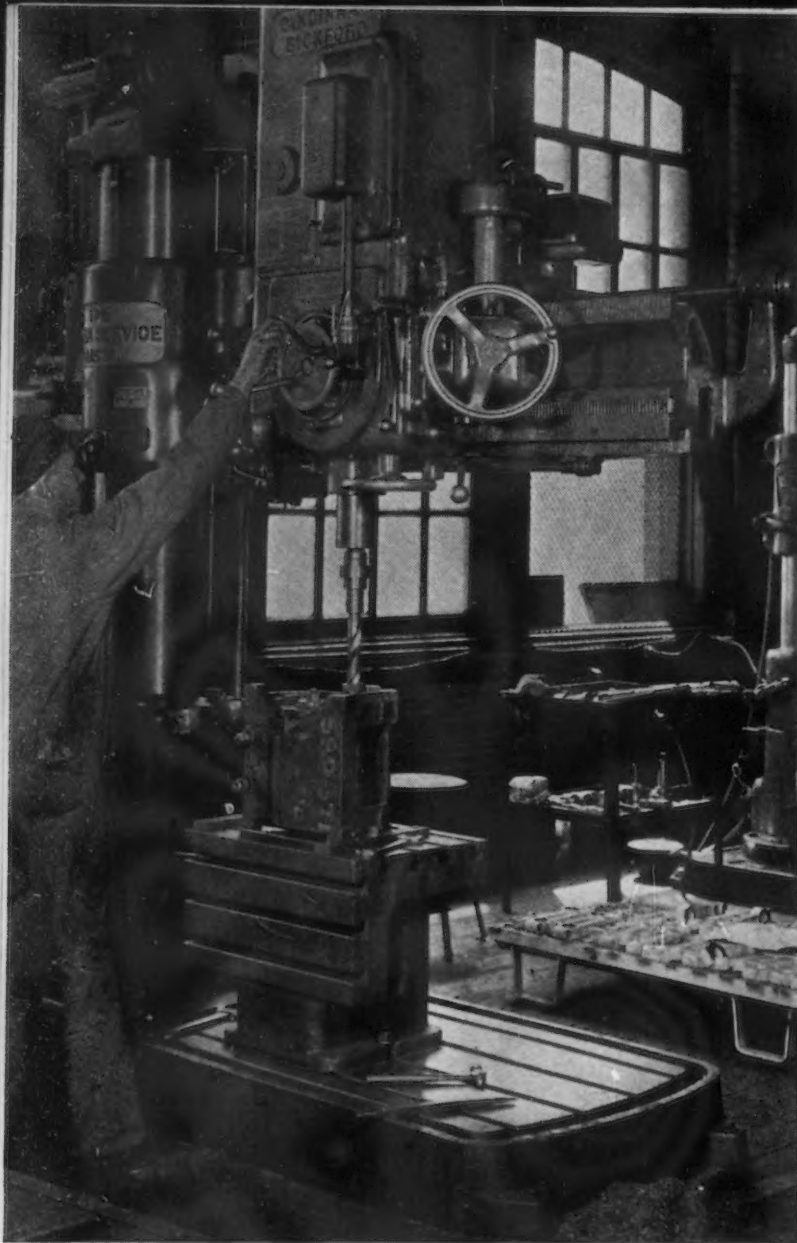
Finally, the weather changed, as weather will. The sun began to peep out again and the good old machine, responding to its stimulus, shook off the last of the so-called improvements and began to turn faster and faster until it appeared that it would soon regain its normal speed.

Whereupon the improvers and experimenters said to the people: "Look what we have done! See how successfully we have kept our promises. Surely you will now put the machine permanently in our charge."

One of the common people asked this question: "Tell us first, how big a bill we will have to pay for all of these improvements and attachments."

And the experimenters replied: "We will take that up with you after election."

*John Van Dine*



# Warner & Swasey

---

**I**N its advertising and in its sales promotion material, the Warner & Swasey Co. is constantly urging manufacturers to replace obsolete machine tool equipment by new machine tools, in order to improve quality of product, increase productivity, cut costs and maintain competitive position.

Warner & Swasey's record of new machine tool installations in its own plant last year shows that the company has itself done exactly what it has recommended to others. In short, it takes its own medicine.

---

in the nature of the company which installs them.

The point of interest is that this concern, makers and sellers of machine tools, are likewise substantial buyers of machine tools. It takes machine tools to make machine tools.

## Nature of Equipment Purchased

The machine tools purchased consisted of grinding machines, drilling machines, milling machines, turret lathes, and so forth. Turret lathes are Warner & Swasey's specialty. Consequently the turret lathes which the company bought were of their own make. A turret lathe is one of those peculiar industrial animals which reproduces its own kind.

The drilling, milling, grinding and other machines were bought

from other machine tool manufacturers. Other machine tool builders, in turn, purchased Warner & Swasey turret lathes. It is a very interesting fact that a large share of machine tool sales every year represent sales of machine tool makers to each other.

The purposes for which the new machine tools were bought were:

1. To increase plant capacity
2. To decrease production time
3. To improve quality of product
4. To replace wornout equipment
5. To provide standby equipment.

There was no guess-work about the installations. As machine tool builders, the company's engineers are constantly called upon to make studies in customers' plants, in order to determine possible savings in cost and increase in efficiency to be realized by installation of



THE Warner & Swasey Co., Cleveland machine tool builder, installed 45 new machine tools in its plant in 1935.

This number is, of course, small in comparison to machine tool purchases by large manufacturers of products such as automobiles or farm equipment. The significance of the statement lies not in the number of machines installed, but



# zy Takes Its Own Medicine ▲ ▲ ▲

new machine tools. The same technique was applied to the Warner & Swasey plant.

## Results

In considering the results of the installations, it is important to bear in mind that the machine tool business differs from most manufacturing businesses in that machine tools cannot be turned out on a mass production basis.

For that reason, savings effected by the new machine tools cannot be computed upon the basis customarily applicable in most businesses.

Consider, for instance, a factory making automobile parts. In such a factory, on a mass production basis, a certain machine tool may be set up chiefly for the purpose of turning out a single item by the hundreds or by the thousands, with little variation from month to

month, or, in some cases, even from year to year.

On such a basis it is comparatively easy to make a simple mathematical estimate which will show increased productivity and lessened cost resulting from the installation of a new and more efficient type of machine tool.

But no such situation exists within a machine tool plant. Machine tools are individually built. It is a peculiar paradox that the business which has contributed the most to mass production efficiency is unable to take advantage of mass production methods in its own plant.

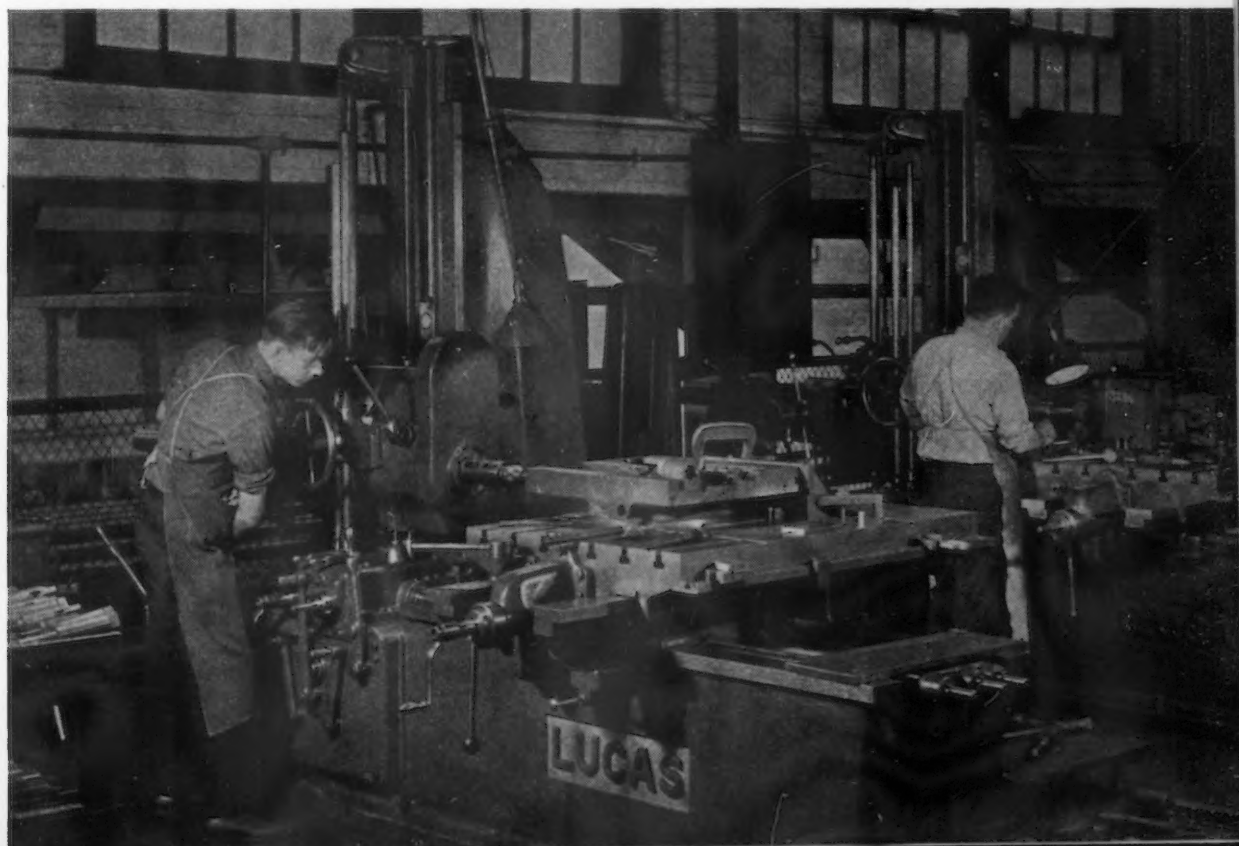
In view of these circumstances, Warner & Swasey's substantial purchases of new machine tools last year take on an added significance. For these new machine tools effected decreases in production cost *in spite of* the fact that

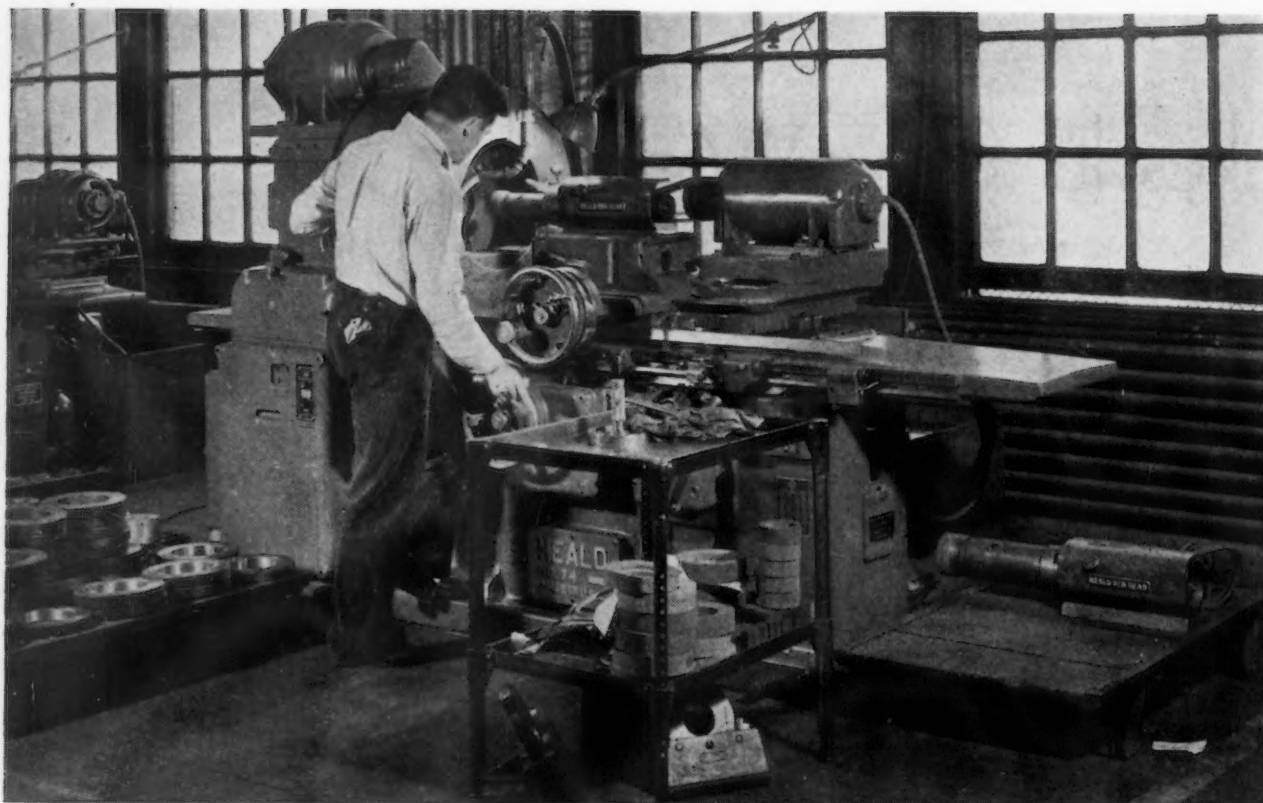
the business does not lend itself to mass production methods.

Economies effected by the new machine tools were due to increased output with smaller unit cost, less maintenance cost, and less down time.

The new machine tools also contributed toward increased efficiency in production because of the improved appearance and neatness of the shop, and because of the attitude of the men in the shop toward the new equipment. Workmen appreciate good equipment and good working conditions. The new equipment has therefore resulted in less shop labor turnover.

Still more important is the maintenance of quality. In machine tool building, the highest accuracy of the product is essential. To make certain of this accuracy, the finest type of production equipment is necessary. The new equip-





## EQUIPMENT PURCHASED

1935

	Equip. No.	Machine	Equip. No.	Machine
JANUARY	1508	Taylor & Fenn Spline Milling Machine	1530	No. 41 Lucas Boring & Drilling Machine
	1509	M-510 2-A Turret Lathe	1531	No. 2—30 in. Allen Single Spindle Drilling Machine
MARCH	1510	4 ft. Bickford Radial Drilling Machine	1532	M-550 No. 3-A Turret Lathe
	542	20 ft. Gray Planer (Rebuilding)	1533	M-520 No. 3-A Turret Lathe
APRIL	1511	Yates-American Univ. Saw Bench	1534	M-520 No. 3-A Turret Lathe
	1512	Greenlee 36 in. Band Saw	1535	M-1220 No. 3 Turret Lathe
	1513	No. 2 Cincinnati Vert. Milling Machine	AUGUST	
	1514	M-1320 No. 4 Turret Lathe	1936	No. 2 Cincinnati Plain Cutter Grinding Machine
	1515	M-510 No. 2-A Turret Lathe	1937	No. 2 RV. Kent-Owens Hand Milling Machine
	1516	Pratt & Whitney 9 in. Gear Tooth Grinder	1938	No. 330T—Giddings & Lewis Boring & Drilling Machine
	1517	1 in. Landis Threading Machine	OCTOBER	
MAY	1518	M-1320 No. 4 Turret Lathe	1539	M-550 No. 3-A Turret Lathe
	1519	M-510 No. 2-A Turret Lathe	1540	M-550 No. 3-A Turret Lathe
	1520	M-510 No. 2-A Turret Lathe	1541	M-510 No. 2-A Turret Lathe
	1521	5 ft. Bickford Radial Drilling Machine	1542	M-470 No. 1-A Turret Lathe
	1522	5 ft. American Radial Drilling Machine	1543	M-1240 No. 5 Turret Lathe
	1523	M-1320 No. 4 Turret Lathe	1544	3 ft. Carlton Radial Drilling Machine
	1524	M-1320 No. 4 Turret Lathe	1545	16 in. x 30 in. Pratt & Whitney Lathe
JUNE	554	20 ft. Gray Planer (Rebuilding)	NOVEMBER	
	1926	Oliver No. 51K Speed Lathe	1546	No. 3L8 LaPointe Broaching Machine
	1527	No. 74 Heald Internal Grinding Machine	1547	No. 72A3 Heald Sizematic Grinding Machine
	1528	10 in. x 48 in. Norton Surface Grinding Machine	DECEMBER	
JULY	1529	No. 16 Blanchard Surface Grinding Machine	1548	30 in. Fosdick Jig Borer
			1549	No. 0 Acme Chaser Grinding Machine
			1550	No. 100 U. S. Electric Tool Co. Polishing Machine
			1551	No. 41 Lucas Boring & Drilling Machine



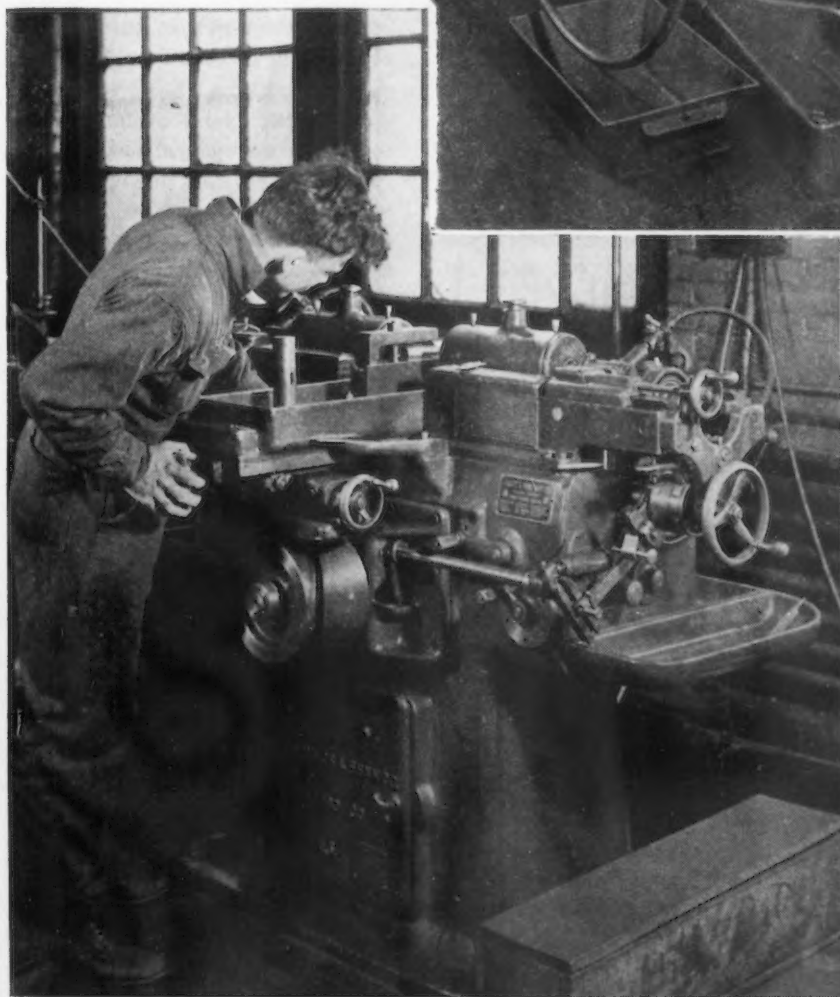
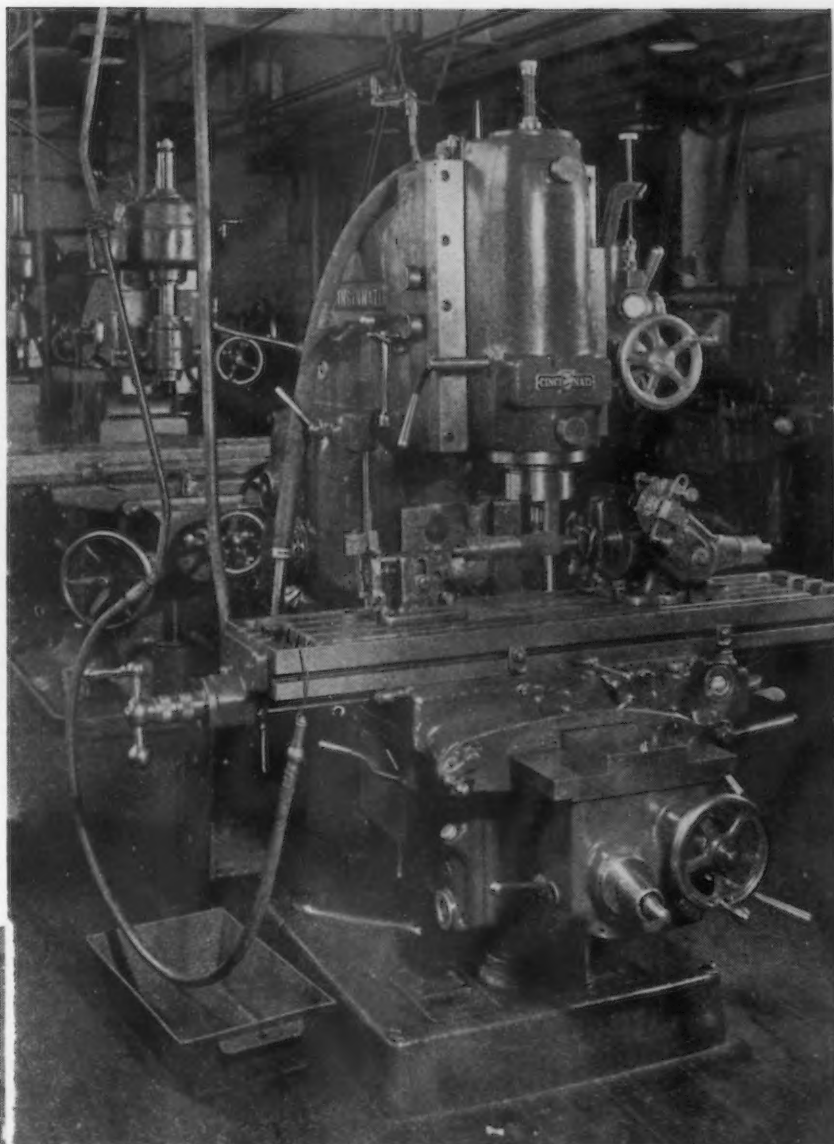
ment therefore had a direct bearing upon the maintenance of the high standards set for the company's products and its reputation among customers and competitors.

### Financial Aspect

On the financial as well as the productive side, Warner & Swasey "took its own medicine."

This company has constantly emphasized to other manufacturers the fact that if the physical assets, competitive position and earning power of a company are to be preserved, it must plow back an ample share of earnings into its plant in the form of new equipment.

Like most industrial enterprises, Warner & Swasey, during the depression, experienced a lean period. As business again began to return in larger volume, severe demands were made upon the income dollar. It was necessary to build up the company's working capital, which had been depleted during depression years. Inventories were inadequate and had to be increased. Furthermore, with increased busi-

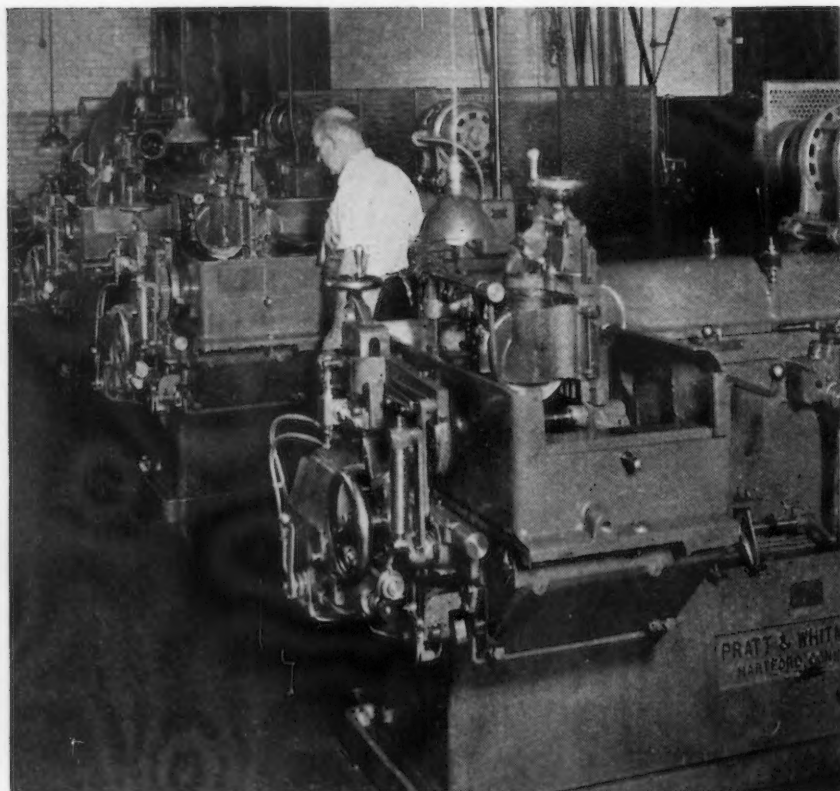


ness, accounts receivable likewise rose. In short it was not easy to translate increased business immediately into increased cash available for expenditure.

Under such circumstances there is always a natural temptation to put off purchasing new plant equipment until other pressing needs have been taken care of.

This policy, however—as Warner & Swasey points out consistently in its sales promotion—merely postpones the inevitable day of reckoning. Sooner or later plant and equipment must be rehabilitated. Any delay in this direction leads inevitably to unduly high production costs, and endangers quality of product and competitive position.

In 1935, therefore, the company plowed back into actual purchases of new equipment an amount equal to its full depreciation allowance



for the year. This money came out of current earnings. The company felt that maintenance of its production capacity on the highest possible level of efficiency was its primary responsibility toward its stockholders and its customers.

#### Benefits

The Warner & Swasey Co., like any other present-day industrial

concern, is in business to stay and to earn a profit.

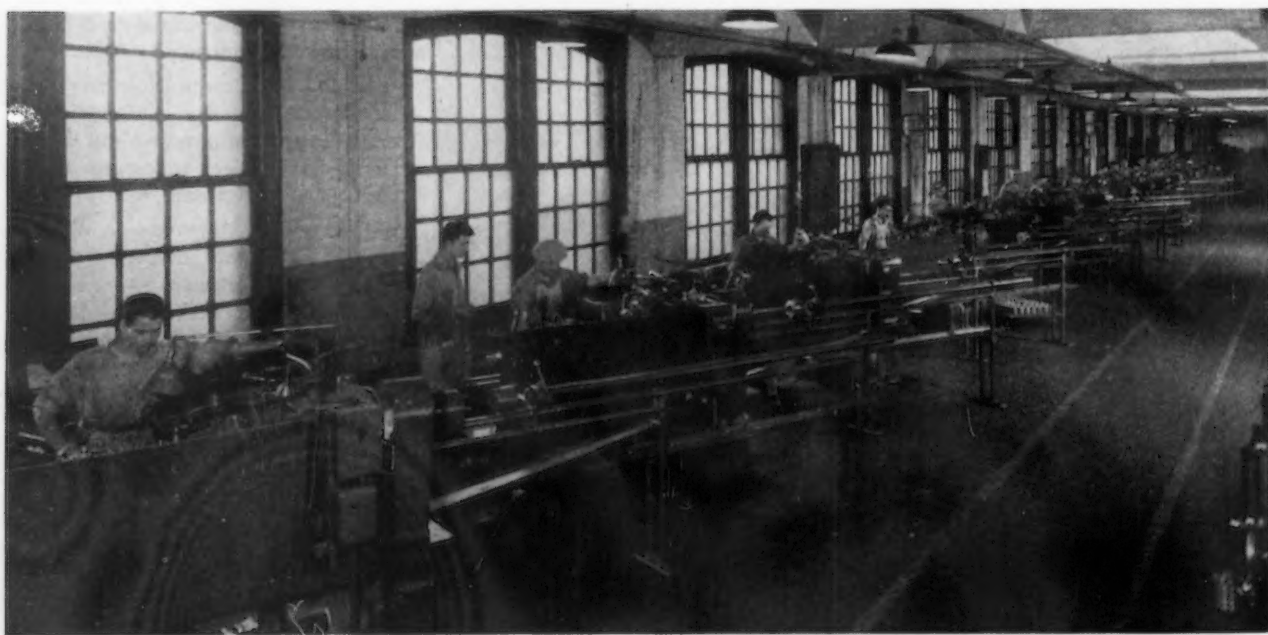
As a machine tool builder, it knows exactly what machine tools will do.

It expects the machine tools which it installed in 1935 to add directly to the company's productivity and profits in 1936.

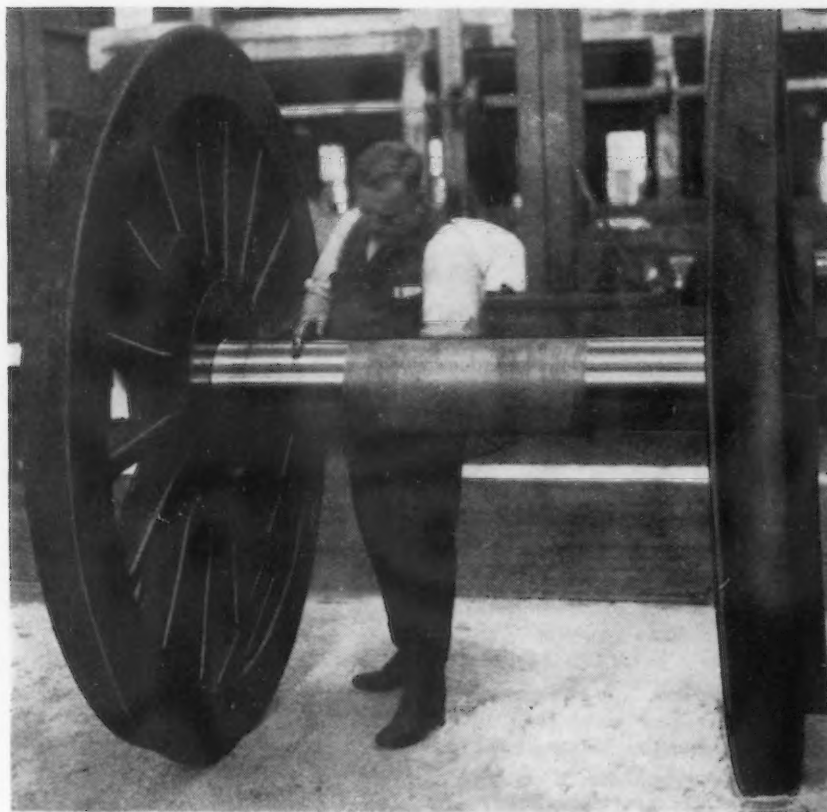
It expects to benefit from these new machine tools not only in

terms of decreased costs, but in terms of maintenance of quality of product, which in turn will be reflected in increased sales.

It anticipates these results in spite of the fact that its business is not set up upon a mass production basis. In a business of a volume production type, the benefits would be correspondingly greater.







# Canadian National Grinds Driving Axle Journals

By M. M. McCALL

• • •

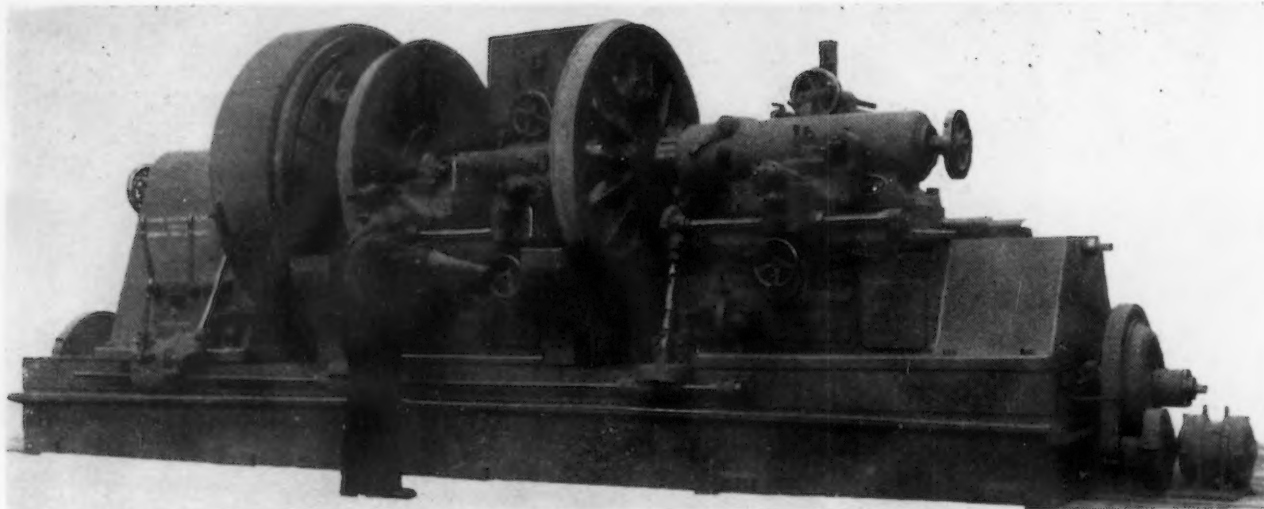
FOR over five years the Canadian National Railways have been successfully grinding the journals on their locomotive driving axles, while burnishing is still the accepted practice in the United States. However, when business conditions justify the expenditure of sufficient funds for new shop

equipment, several large railroads in the States will no doubt seriously consider the grinding of their driving axle journals, as their representatives have visited the Stratford shops of the Canadian National Railways to thoroughly investigate the possibilities of the process.

The grinding operations are performed on 90-in. combination journal turning and grinding machines built by The John Bertram & Sons Co. of Dundas, Ontario. These machines are located in the Canadian National Railways shops in

Montreal, Que.; Winnipeg, Man.; Moncton, N. B.; and Stratford, Ont. The Canadian Pacific Railways have machines in their Montreal and Winnipeg shops.

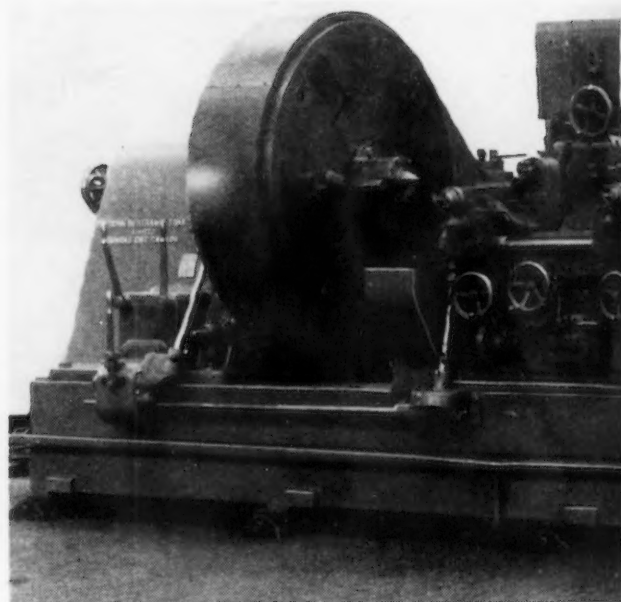
Fig. 1 shows a general view of one of these machines, which is equipped with outside journal turning and grinding attachments for turning and grinding the outside journals on locomotive trailer sets. Fig. 2 shows a machine without the outside attachments. The Niles 90-in. locomotive journal turning lathe described in the Feb. 28, 1935, issue of THE IRON AGE



ABOVE

FIG. 1—Ninety-inch combination journal turning and grinding machine with outside journal turning and grinding attachments for trailer sets with outside journals.

o o o



was used as a basis for the design of this machine.

Fig. 3 is a view along the center line of the machine looking toward the headstock. The two V-blocks are used for supporting the wheel set during the loading and unloading operations. The journals rest on the V-blocks, which have independent vertical adjustment by means of the two lowest-positioned handwheels on the front of the turning rest shown in Fig. 2. The wheel set is adjusted by these handwheels until the center holes in the axle line up with the headstock and tailstock centers. The tailstock barrel is adjusted by hand to center the tailstock end of the wheel set, while the headstock end is centered by traversing the headstock along the bed by a 5-hp. motor driving through a torque-limiting friction clutch to cushion any shocks. As the headstock is traversed into position, the crank pin will enter an oval-shaped clearance hole in the face plate and permit the face plate to be brought up close to the driving wheel. The overhang of the tailstock barrel is sufficient to provide clearance for the crank pin on the wheel next to the tailstock.

On the machine with outside attachments, the attachments are mounted on a large base which also carries the tailstock. This base is provided with power traverse along the bed from a 5-hp. motor to adjust the base to its different locations for operations on driving wheel sets or trailer sets with outside journals. The tailstock on the machine without outside attach-

ments has no power adjustment along the bed, as practically no adjustment is required.

Renewable steel wear plates are fastened to the surface of the bed on which the headstock is traversed. The T-slots under both headstock and tailstock have renewable steel plates to take the clamping thrust. The headstock and tailstock are clamped in position by single levers from the front. The driver shown in place in the T-slots on the face plate in Fig. 3 is clamped to one of the wheel spokes to rotate the wheel set. The driver may be seen in position in the upper left corner of Fig. 4.

The heavy counterweights of the driving wheels exert considerable

centrifugal force when the set is rotated at speeds suitable for journal turning and grinding. To compensate for this, the face plate contains a ring counterweight which is adjustable to counterbalance the effect of the driving wheel counterweights. This counterweight is located entirely within the faceplate. It is a single casting with one simple adjustment for different size wheel sets, the adjustment being made by simply turning a wrench. The adjustment is through bevel gears and screw. A pointer shows the position of the counterweight from zero to maximum counterweighting, which is sufficient for the largest wheel sets. To assist in obtaining the correct balance, an ammeter is placed in the circuit of the driving motor. An

even flow of current indicates the proper position of the counterweight. A hand brake is provided to stop the face plate at any desired position.

The face plate is driven by a 15-hp. constant speed motor mounted on the back of the headstock through silent chain to a four-speed totally enclosed sliding gear box. The final drive to the face plate is by multiple V-belts with adjustable idler, the grooves being cut in the outside diameter of the face plate. Fig. 5 shows the drive arrangement. The levers for changing the different speeds are carried

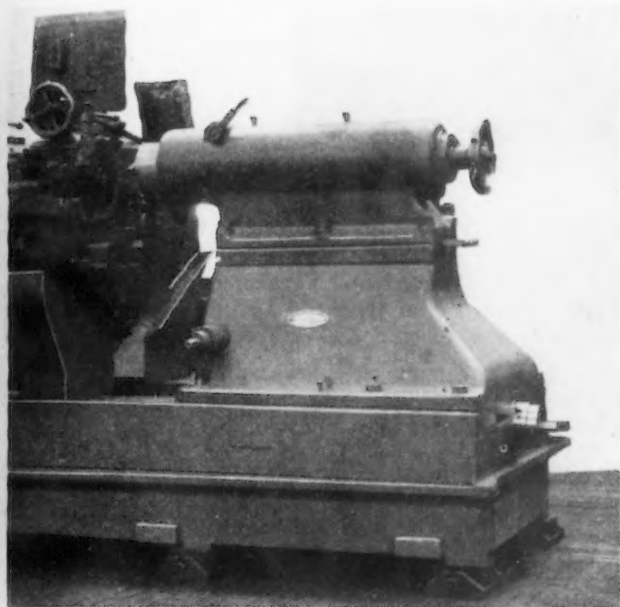
through the headstock to the front of the machine.

The inside journal unit consists of a box type base arranged for turning rests in front and the grinding rests at the back. The turning rests have power longitudinal feed, and also power cross feed for facing hub liners. The feed mechanism is driven by a gear attached to the face plate. Three different feeds may be selected in a change gear box attached to the headstock. Each turning rest is provided with two-screw open-side tool posts, which may be seen in Figs. 3 and 4.

The grinding saddle has one V and one flat way so designed that abrasive cannot impair their accuracy. This saddle has a power longitudinal reciprocating mechanism housed in the base, which is adjustable for length of stroke through an automatic reverse plate built by the Cincinnati Grinders, Inc.

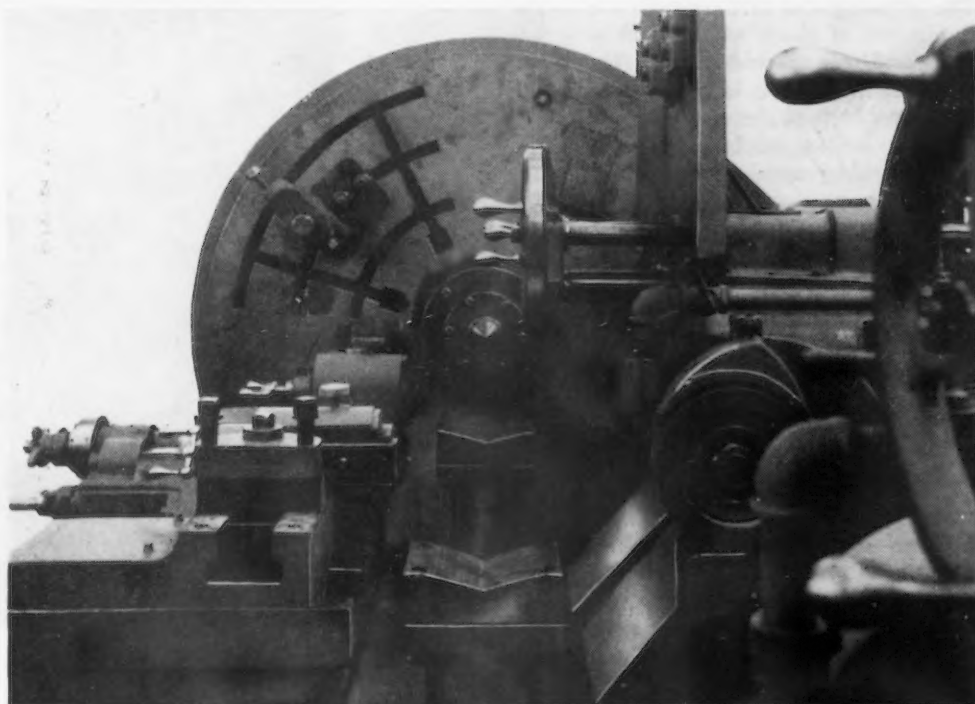
The two grinding heads are driven by independent 12-hp. motors through spiral bevel gears, the grinding spindles being mounted on precision anti-friction bearings. When fastened closely together as shown in the rear view, Fig. 6, the heads will grind the longest journals (up to about 22½ in.). For the shorter journals, the heads are fastened with a distance piece between them, as shown in Fig. 7. This arrangement saves unnecessary overtravel of the grinding wheels.

Power in and out quick traverse is available for each wheel slide by 1-hp. motors. Hand-operated independent cross adjustment is provided for each wheel slide for fine adjustment of cut, the handwheels being graduated. During the grinding operation these handwheels may be pulled forward over the axle closer to the operator's position, as they are mounted on slides with splined shafts. These handwheels and slides may be seen in Figs. 2 and 3. Counterweights are used to hold the wheel slides back against the in-feed screws and pre-



AT LEFT  
FIG. 2—Ninety-inch combination journal turning and grinding machine without outside attachments.

AT RIGHT  
FIG. 3—View along center line of machine looking toward face plate. Turning rests are to the left and grinding rests to the right. V-blocks for loading and unloading are in the center and the driver is bolted in the face plate slots.





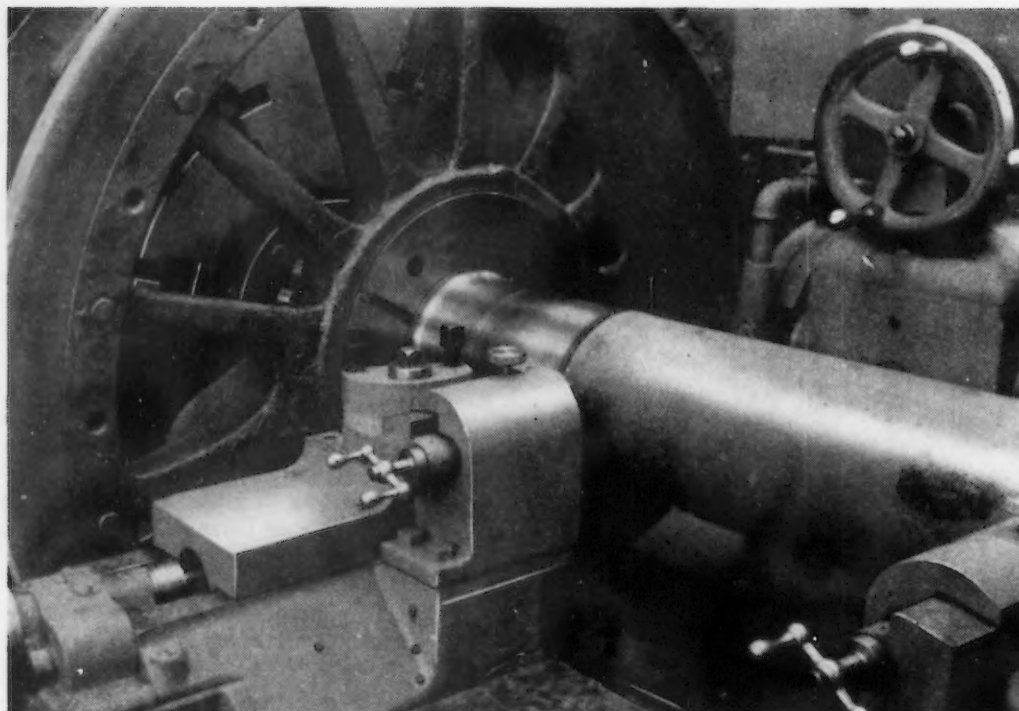


FIG. 4—View showing turning tool rests and adjustable grinding back stops with maple shoes. The driver may be seen against the spoke in the upper left corner.

vent the grinding wheels from creeping into the axles.

The automatic reverse mechanism housed in the base is driven by a 1-hp. motor, all controls being easily accessible to the operator from the front of the machine. Each turning rest is provided with an adjustable grinding back-stop with maple shoe.

When equipped with outside journal attachments, a box-type base carries a grinding rest in the rear and a turning rest in the front with the tailstock located between. The grinding and turning rests are duplicates of those on the central unit and are provided with the same controls. It is, of course, necessary to turn the wheel set end for end in the machine to grind both outside journals.

The grinding wheels are dressed by clamping the dressing tool holders to the axle. The grinding wheels are rotated and reciprocated past the dressing tools at the proper speed. An arrangement is provided on the dressing tool holders for forming a radius on the edge of the wheel which grinds up to the fillet on the journal.

The Canadian National Railways shops at Stratford, Ont., have been grinding the journals on their driving axles since 1930. During that time there have been no hot boxes or axle failures that could be charged to the grinding operation.

When a locomotive is being reconditioned, the driving axle journals must be trued up and ground if 0.020 in. taper or hollow; 1/64 in. out of round, or if the surface is scratched.

While a turning cut is frequently taken on the journals before the grinding operation, it has been found to be unnecessary in many cases. The journals on wheel sets

that have passed through the grinder have been found to be round and parallel in many cases even after 150,000 miles of service.

Stratford practice requires the main axle brasses to be bored to the same diameter as the journals and fitted down by hand. The brasses for all other driving axle journals are bored .010 in. larger than the journals and no fitting

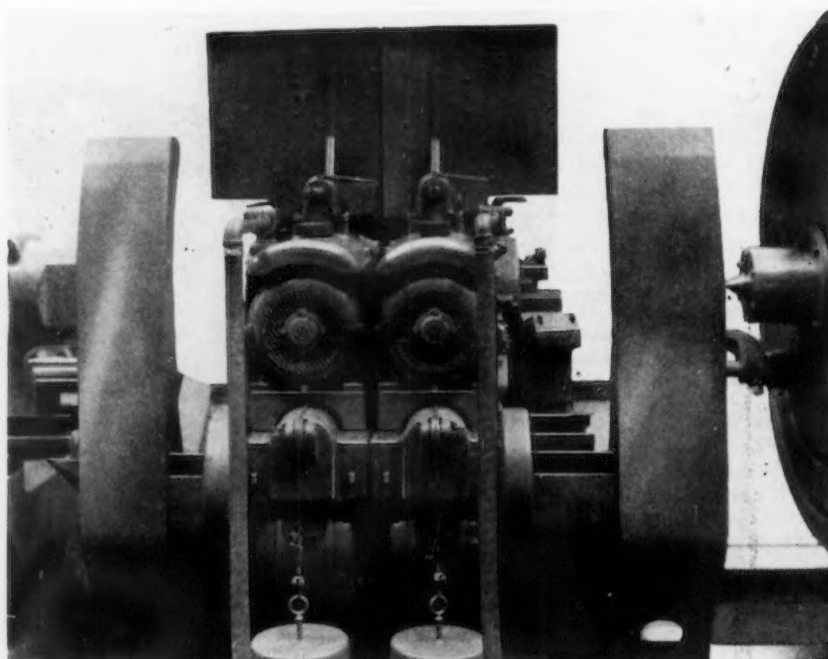
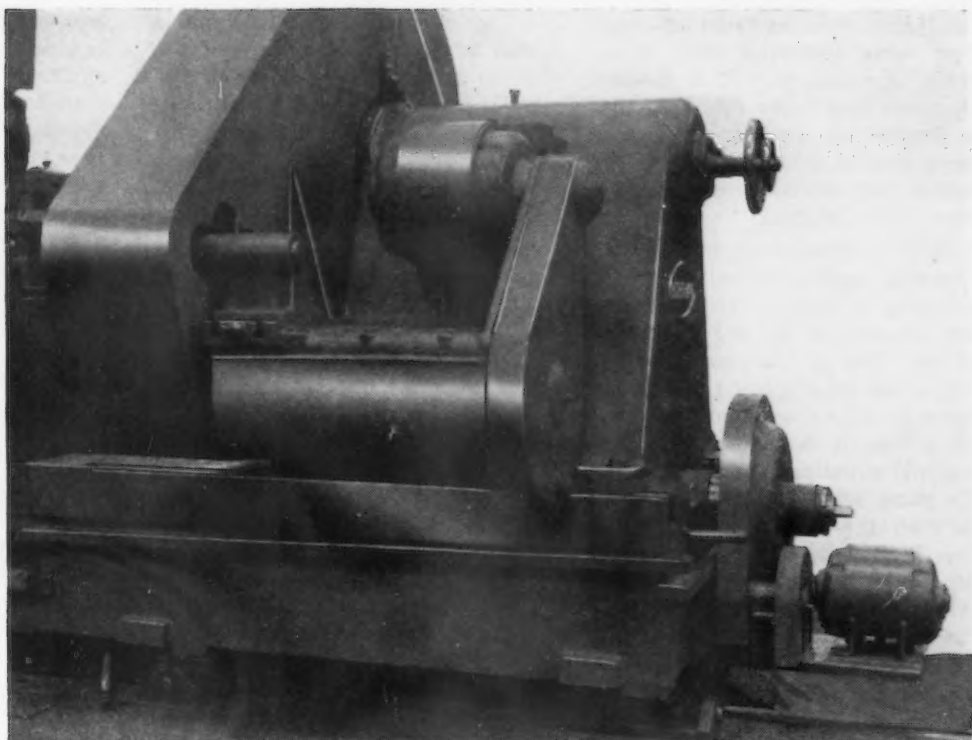


FIG. 6—Rear view of grinding heads showing them fastened closely together for grinding long journals.

FIG. 5—Rear view of headstock showing the drive to the face plate. Silent chain drives to the speed box and multiple V-belts from speed box to the circumference of the face plate.



except the removal of burrs is necessary.

Aloxite wheels made by the Canadian Carborundum Co. of Niagara Falls, Ontario, are used by the Stratford shops. The wheels are grade M, grit No. 301 and bond No. 28. Ten-inch and 14-in. diameter wheels with 3-in. faces are purchased. The 10-in. wheel is necessary when grinding the journals on certain wheel sets which

have counterweights with projections on the inside of the wheels. Two 14-in. wheels is the average consumption per year. Other shops have used Norton No. 36K wheels made by the Norton Co. of Canada.

No attempts have been made at Stratford for any spectacular production records on the journal turning and grinding machine. During a recent visit to the shops, the 9½ in. x 12 in. journals on a

driving wheel set were turned and ground in one hour, floor to floor time. This included about 5 min. for dressing the grinding wheels. The time could be cut somewhat if the Stratford machine was equipped with adjustable grinding heads like those illustrated in Figs. 6 and 7. The Stratford machine has fixed grinding heads, the wheels being positioned for the longest journals (about 22½ in.). The grinding operation on shorter journals requires the same travel as for the long journals.

It is claimed by the manufacturer that the grinding of the driving axle journals insures (1) More accurate and better finished journals, (2) Greater freedom from hot boxes, (3) A material increase in the life of the axle due to the savings in material when reconditioning the journals, (4) 125,000 miles of operation without grinding the journals, indicating a possible greater mileage between reconditionings, and (5) Increased production.

While watching the reconditioning of the journals on a wheel set at Stratford, the first grinding cut after a light turning cut disclosed a hollow spot about 5 in. in diameter on the surface of one of the journals. Each successive grinding cut reduced the diameter of

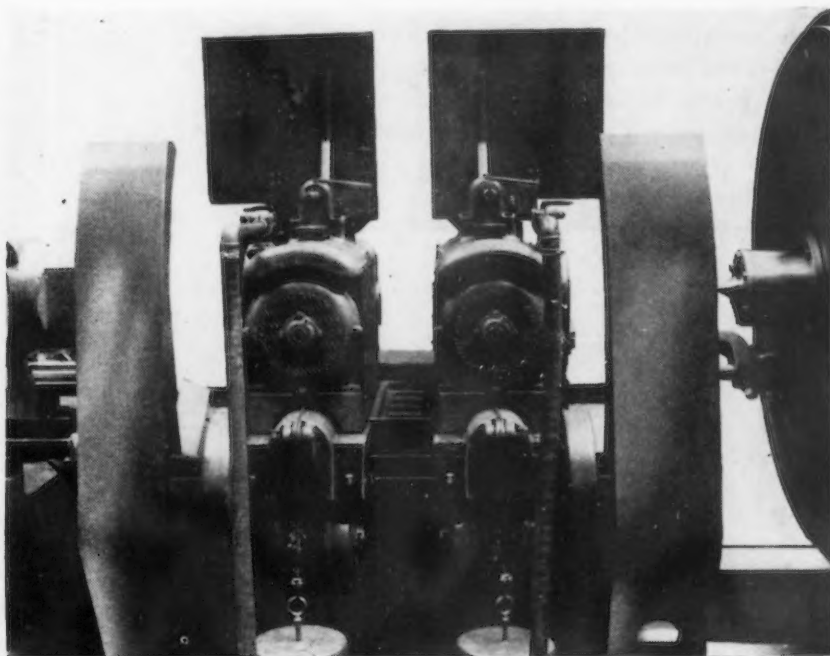


FIG. 7—Rear view of grinding heads with distance piece between them for grinding shorter journals.

the hollow spot, the grinding operation being continued until it entirely disappeared. It is claimed by those who favor grinding, that a burnishing operation on this same journal could not remove the hollow imperfection from the surface of the journal.

It is interesting to note the increasing application of the art of grinding to many different finishing operations in the Stratford shops. One of the most interesting, is the grinding of the cylinder bores in their single and compound air pumps. A double end Churchill internal grinding machine is used, the pump being mounted on a table between the two grinding heads. One head grinds the steam cylinder while the other grinds the air cylinder, the machine insuring that the two cylinders are in line. The grinding of the cylinders in this manner has reduced packing troubles on the common piston rod to a minimum. Recently, the cylinders of a new pump were ground before it was placed in service to obtain better surfaces than those left by the boring tools of the builder. In spite of the success of this grinding application at the Stratford shops, the manufacturer of the pumps will not consider the grinding of their pump cylinders.

The same Churchill machine is used to simultaneously grind the steam and water cylinders of the boiler water feed pumps, maintaining them in perfect alinement with the consequent reduction of packing troubles on the rod.

The steel liners for their Diesel engine cylinders are ground on one end of the Churchill machine while held in special fixtures. Being made of steel, they are bored before the grinding operation.

All piston rods, and valve motion pins together with the eye holes in the valve motion rods, are now ground in the Stratford shops.

While the grinding of driving axle journals is now common practice throughout Canada, the grinding of car axle journals has not met with the same success. However, it is common practice in Europe and may soon be worked out in Canada as well as the United States. It is the opinion of some that better lubrication will be necessary before ground car axle journals will be in general use. This is based on the theory that the accuracy of the ground car axle journals does not permit proper lubrication with existing methods. The driving axle pushes the locomotive, creating pressure

against the brass of the driving box on the side where the journal surface is rotating downward. This leaves clearance between the driving box and the journal surface on the side where the journal surface is rotating upward, and permits the rotating journal to carry the lubricant up to the top journal surface where the weight of the locomotive is supported. As the locomotive pulls the cars, the car axles are pulled along by the cars, creating pressure against the brass of the car box on the side where the journal surface is rotating upward. This condition is just the reverse of that existing on the driving journal, and the accuracy of the ground journal surface against the car box brass prevents the carrying of the lubricant upward to the top where the weight of the car is supported. It is contended that the inaccuracies existent on a burnished journal surface permit more lubricant to pass through the pressure zone between the journal and the brass.

According to another theory, the driving axle journals are easier to lubricate because the direction of the force from the driving pin is variable, whereas the direction of the force on the car axle journal is constant.





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## *For Distinguished Service—*

ON Monday and Tuesday of this week, the members of the National Machine Tool Builders' Association gathered in Chicago, on the occasion of their semi-annual meeting. Elsewhere in this issue of THE IRON AGE is a report of their program of activities.

This was indeed a red-letter meeting of the association, for just one week previous it had been given the Award of Merit by the American Trade Association Executives for outstanding achievement by a trade association during the past three years.

It must be particularly gratifying to the distinguished president of the N.M.T.B.A., N. D. MacLeod, and its indefatigable general manager, Herman H. Lind, as well as to the members-at-large, to know that their organization was selected for this signal honor.

We are all admirers of courage, inheriting an appreciation of it from generations of ancestors who fearlessly pressed forward in spite of odds. It takes a high grade of courage to bring an industry successfully through the ravages of depression and to reestablish it once more upon a prosperous plane of real public service. To the officers, directors and members of the National Machine Tool Builders' Association go the plaudits and good wishes of the entire metal-working industry to which it has set such a fine example.

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HERMAN H. LIND, General Manager, National Machine Tool Builders' Association. Drawn by John Frew for The Iron Age.



NORMAN D. MacLEOD, President, National Machine Tool Builders' Association. Drawn by John Frew for The Iron Age.





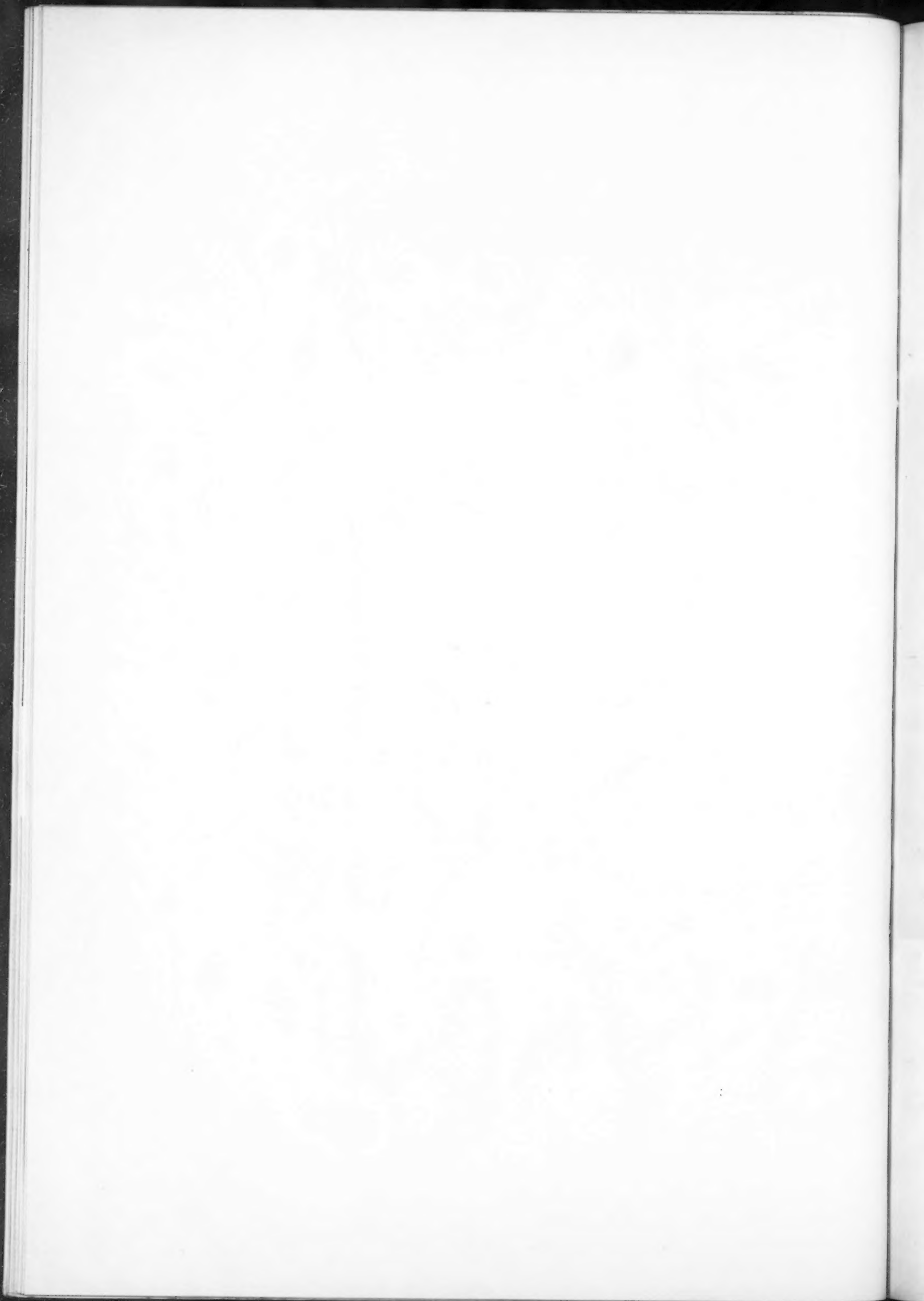




FIG. 1—The Buick rear bearing retainer calls for a variety of turning, boring, facing, drilling and tapping operations that can best be handled in multi-tool set-ups.

## Buick Favors Combined Operations In Special-Purpose Machines

By FRANK J. OLIVER

*Detroit Editor, The Iron Age*



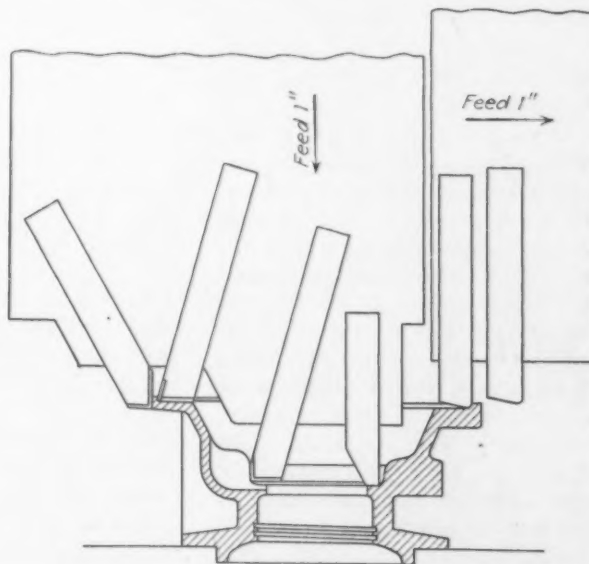
ONE of the tooling principles made apparent in Buick's recent modernization program is the combination of operations as far as possible in single units. More efficient use of floor space and fuller utilization of the machine attendant's time are possible not only where a group of related operations are performed in a single set-up, but also where two different set-ups are made in the same station-type fixture. Several good examples of this type of tooling are found in the machining of the cast-iron rear bearing retainer for the Buick Model 40 transmission. Here, practically 95 per cent of the operations are performed in three machines, out of a total line of five. In previous years, the same piece was carried through the same number of operations, but through more than double the number of machines.

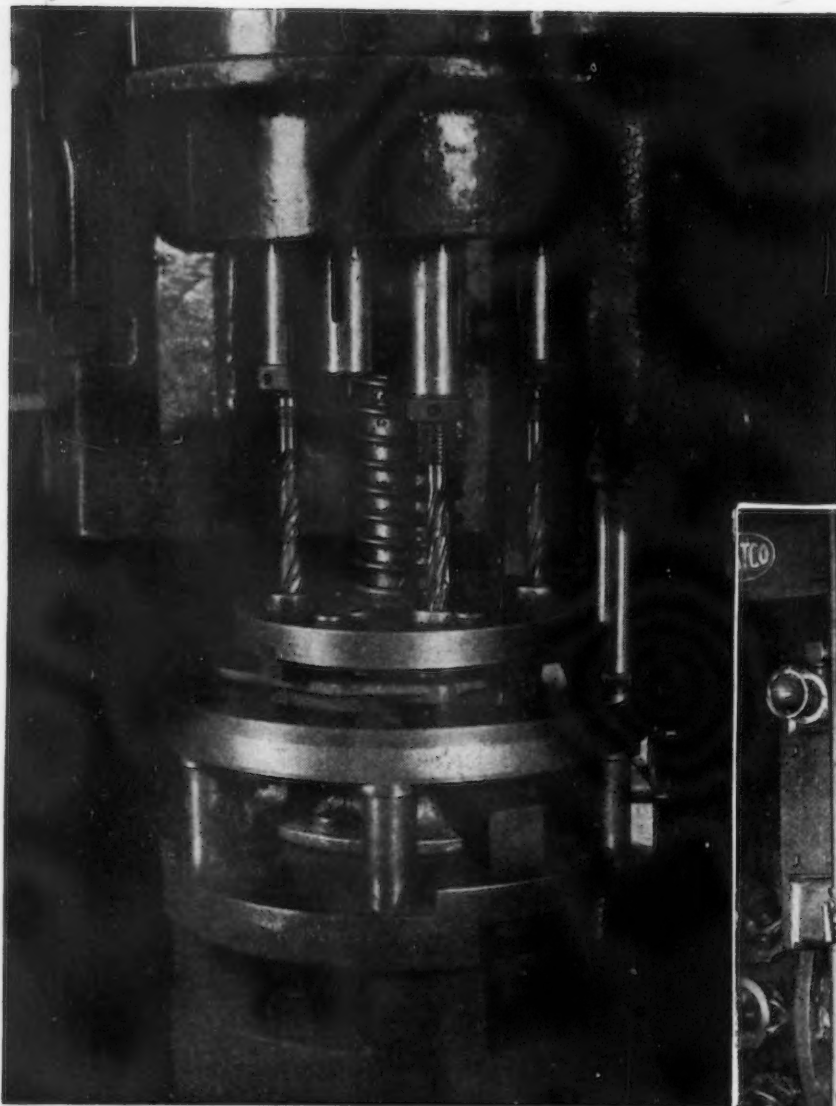
The completed piece is shown in Fig. 1. First set-up of the rough

casting is in a 6-station Bullard Mult-Au-Matic, where such standard operations are performed as rough and finish turning and facing, boring, rough reaming and countersinking. The second set-up is also in a Bullard Type D ma-

chine. There are a number of noteworthy features, however, not found in the average chucking job. There are eight stations, for example, but the machine is designed to index two stations at a time. Cycle sequence is 1-4-3-6-5-8-7-2.

FIG. 2—Typical of the multi-tool turning operations performed on this Buick casting is this set-up in a Bullard, employing a double-purpose head.





of the ordinary is the turning of the O. D. of the flange shoulder, or pilot, concentric with the main bearing bore. A plain boring head is used on the machine, but the tool holder itself is a pot-type head carrying the single-point tool. This head is allowed a slight amount of radial float and is centered by a pilot bar that engages the bearing bore.

At the second station, which is really the unloading station, there is a multiple drill head, Fig. 3, with guide plate and five combina-

The part as it comes to the machine is loaded at station 1, indexed to 3, then to 5, 7 and back to 1. At this stage the casting is unclamped, turned over and chucked in station 2, a new part being loaded in station 1. On the second round, the piece is indexed from station 2 to 4, to 6 to 8 and back to 2, from which it is unloaded.

At stations 3, 5, 7 and 4, double-purpose multi-tool heads are employed, having both down feed and cross feed at a 1:1 ratio. Station 3, illustrated in Fig. 2, has six tools working and is the longest operation—1 min., 10 sec. Stellite bits are used on all turning tools and the cutting speeds vary from 75 ft. a min. for roughing work to 150 ft. a min. for finish turning. Feeds vary from 0.0125 to 0.025 in. per rev., with the exception of a grooving operation performed at station 6 on the second chucking, a very special set-up. In this

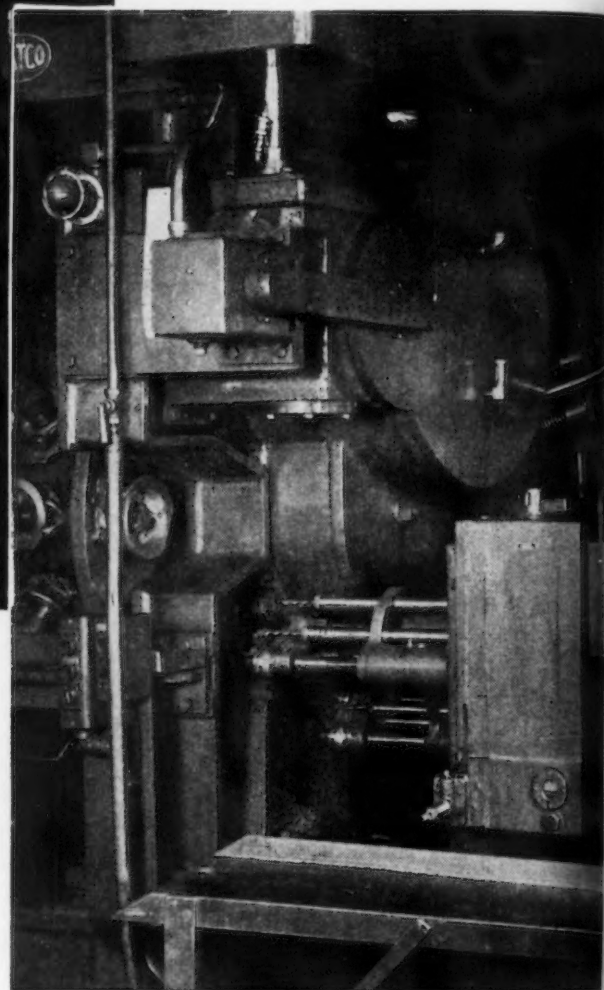
ABOVE

**FIG. 3**—Drilling in a vertical chucking machine. Registration of the drill guide plate and the rotating chuck is effected by the lock pin at the right.

• • •

instance, a universal head with grooving and facing slide is used and the grooving tools (high-speed steel) are carried on a bar which is fed vertically downward into the hole, then moved in and out of the cut by a cam on the main slide. These grooves are for the snap rings to hold the bearing in place.

Another operation that is out



**FIG. 4**—The use of welded steel construction for the drilling units and separately driven tapping units, lends related operations on the piece.

tion drills and reamers. Registration of the guide plate with the chuck, and hence with the piece itself, is effected by an overrunning clutch and lock pin, shown to the right in the photograph. As soon as the pin engages the slot, head and chuck revolve as a unit, and the drills are rotated by pinions and an internal ring gear.



Center location of the guide plate is effected by the finished pilot diameter on the piece. Drilling time is 21 sec., leaving almost 50 sec. for changing pieces while the longest turning operation is being performed in station 3. Total floor-to-floor time is 1 min. 22 sec., and hourly production at 85 per cent efficiency is 37 pieces.

A double-station fixture is also employed in the third machine, which is a Natco six-way combination drilling and tapping machine. In two set-ups on the same trunnion fixture rotating in a vertical

of standard drilling and tapping units mounted at various angles on a welded steel base. All the drilling heads have self-contained hydraulic units and in addition, the tapping heads are equipped with individual lead screws to each tap.

The left-hand horizontal unit, for example, is arranged with a cluster box containing seven drill spindles and one tapping spindle complete with lead screw, nut plate and tap holder, driven separately by a reversing motor. This left-hand head performs such opera-

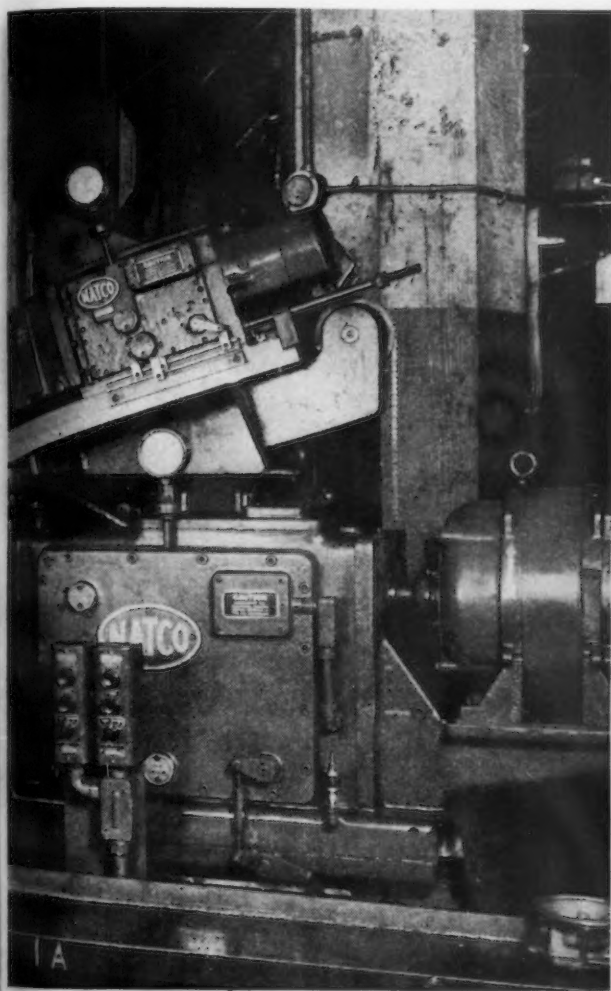
tions as drilling at the second station, reaming at the third, drilling at the fourth, rough spotfacing at the fifth, finish spotfacing and chamfering at the sixth, reaming at the seventh, line reaming two separate holes at the eighth, and tapping a single hole in the ninth position.

The large right-hand horizontal unit as shown in the photograph, Fig. 4, has fourteen standard spindles plus an additional cluster box of six tapping spindles driven separately with a lead screw as mentioned above. In position 2, seven holes are drilled by this head; in position 3, six are countersunk and a seventh hole drilled; and in position 4 the six holes are tapped. The small angular unit mounted above the large right-hand horizontal unit is employed to drill a single hole at a 17 deg. angle.

(CONCLUDED ON PAGE 114)

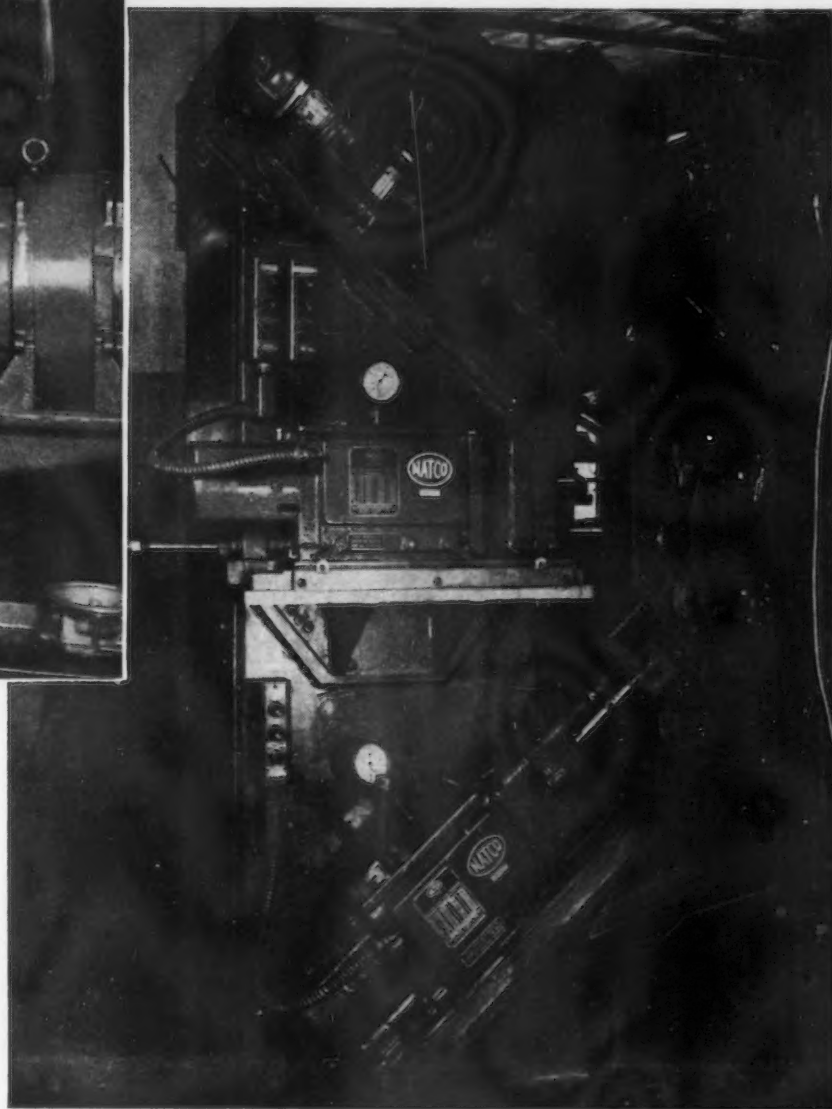
#### BELOW

FIG. 5—Some of the possibilities of a rotating drum-type fixture are made apparent with unit drilling and tapping heads arranged at convenient angles.



base and fixture, in conjunction with hydraulic itself to almost any conceivable combination of Only two of six heads are shown.

plane, a total of 37 drilling, reaming, spotfacing, chamfering and tapping operations are performed. Altogether, there are nine positions in the automatic trunnion type fixture, in each of which are two castings, one placed with its axis radial and the other parallel to the axis of the fixture. The machine is made up of a number





## In Obsolescence, Management



NOTHING is quite so prone to become covered with the mildew of obsolescence as an idea.

Not that an old idea is necessarily

Digest of a paper by R. E. W. Harrison, Chambersburg Engineering Co., before the Philadelphia chapter, American Society of Mechanical Engineers.

obsolete; our interpretations and applications may become obsolete, but ideas which have withstood the onslaughts of time are unlikely to be found obsolete. I would cite the English common law, the Ten Commandments, the profit motive, old and time worn conceptions of business honor and integrity, and the

Constitution of the United States of America as examples. Such ideas are definitely not obsolete.

In connection with charged failures, it can be said that we have invariably departed from fundamental principles and taken voyages extremely dangerous in a commercial way.

In matters of a business nature, whether personal or in the form of mechanisms, the capital structure must be progressively preserved in order that bettered services, based upon some original service may be rendered over and over again. The measure of preservation is fundamentally determined by profit earning capacity, and its continuity.

All of the business with which we are concerned, financially or in terms of employment, consists primarily of men and machines. The constructive utility of both is made possible by funds-availability which is basically generated by profits derived because of satisfactory service such as instigates repeated demands.

These fundamental ideas have proved themselves sound during the processes of time. They have particularly demonstrated themselves in connection with our machine tool industry.

The major executive is the main weapon against obsolescence. It is self-evident that if his ideas are obsolete, competition wins. Trees die from the top so do industrial plants. Obsolescence in a shop is not the result of ideas which prevail in the minds of those who are classed in brackets below management.

The correction of obsolete ideas in management is often deferred by the receipt of a fat life-saver order. This pain relief, as in the case

knowing what one's competitors are achieving. In no industry is there such complete frankness and cooperation in the exchange of useful information as in the machine tool field. This has been demonstrated as good business in the development of abilities to produce more in order that additional persons may become ultimate customers through lowered costs. This exchange of information is an altruistic investment, the value of which is well proven. In culmination it presented its results at the machine tool show in Cleveland during the month of September, 1935.

### The Sales Department Versus Obsolescence

A real sales department may be likened to two beacons on a coast; the lower serving on immediate sales and revenues; the upper, reaching out over the tides and measuring and gaging winds, storms and sunshines of the future. Call it sales research, if you will, featuring education in order that more may be snugly within doors when the storms blow. Indoors, with reserves to feed the fires and provide warmth until the sunshine comes again.

Whether your business is large or small it needs two beacons. The records of both Dun & Bradstreets and of our bankruptcy courts attest such necessity. The fact that long life is characteristic

broadening knowledge of a national value in research findings.

### Obsolescence in Financial Departments

Germs of obsolescence laden the air in many industrial departments because of ideas in connection with the spending of funds for speeding up production. We will all step aside that an organization treasurer may pass, for he is the man who has to look the payroll in the face. He is however a carrier of germs. Germs of his idea pervade lines of equipment, cost accounting and routine facilities, and thus he represents management in a predetermined way, whether for good or for evil.

### Government Attitude

It is again demonstrated that real and lasting action, with respect to activities which involve the parts played by industries in employment, must come from industry and have cooperation of government agencies. Each of these elements must recognize the fundamentals referred to above. Neither barrages of political activity nor barricades of managements can serve to make each element cooperatively efficient in effecting a return to standards of living which have been lowered because of lessened available profits with which to sustain the wants and needs of human beings regardless of race, creed, color or location.

## ent Ideas Are Fundamental

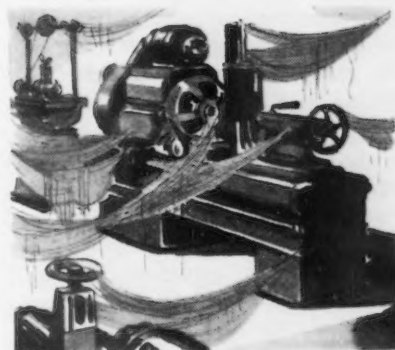
of many a raging tooth-ache which vanishes when the patient crosses the threshold of the dentist's office, is only temporary.

### The Competitive Yardstick

In a country like the United States, there is little excuse for not

of individual organizations within the machine tool industry only heightens desirability of increased sales research in order that fewer organizations which supply employment may have difficulty in maintaining the characteristic. Again your sales department is a natural educational factor for

## Machinery and Equipment Express Them







TODAY the artist and the engineer work side by side. Beauty and utility are no longer considered to be antagonistic, but rather supplemental. Of course, utility still is, and always will be, the prime requisite of any machine as well as of most equipment. But utility alone is no longer enough. The buying public, even the technical public, demands that the objects it works with be attractive in appearance as well as efficient in performance.

Modern ideas of beauty have changed radically, and are responsible for the new spirit of cooperation between artist and engineer. Formerly a strictly utilitarian article was not considered attractive unless its utilitarian features could be covered beneath irrelevant ornamentation, or obscured in some other manner. Thus, the old idea of beautifying machinery and equipment (on the comparatively infrequent occasions when beautification was attempted) was to hide the function of the product. The new idea is exactly the reverse. True beauty in machinery emphasizes its function, thus inspiring confidence in its capacity to perform adequately the task for which it was built. In fact, beauty, in the modern sense, is a *product of function*.

Perhaps the most obvious example of this principle is the streamlining of airplanes, trains, automobiles, and other fast-moving vehicles. The function is speed of movement, and the streamlining aids and emphasizes that function. Furthermore, the streamlining beautifies and modernizes the product. True, streamlining for reduced air resistance is, of course, a matter of basic design, but the streamline effect can be secured by the use of finishing materials alone. To illustrate this latter point, consider an extreme example, i.e., an ordinary rectangular box which does not naturally lend itself to streamlining. With even such unpromising material as this, the finisher can gain something of the streamline effect, as demonstrated in Fig. 1.

We have illustrated this point to show what *can* be done in an extreme case, rather than what *should* be done in the average case. For, of course, the streamlining of a rectangular structure is all wrong in principle. It violates the first fundamental rule we have just

# Eye Appeal in Machinery

o o o

By ALBERT F. BYERS

Art Director, Benjamin Franklin  
Paint & Varnish Co.

o o o

mentioned, namely, that beauty is a product of function and should emphasize rather than obscure that function. Streamlining is out of place in any object save one which moves rapidly or which is intended to give the illusion of movement. The box, illustrated in Fig. 1, is streamlined. However, it is not beautiful because there is a conflict rather than a coordination of ideas. The shape is opposed to movement, while the design is opposed to rest. As a result, a perhaps un-self-conscious antagonism is roused in the mind of the beholder.

## Function Stressed in Design

Nevertheless, it is not the principle that is at fault here, but the application of that principle. It illustrates in an elemental but forceful manner what can happen when the engineer and the artist work independently of each other and without a true understanding of each other's problems.

If the rectangle we have illustrated forms the basic outline of a stationary machine, cabinet, or chest, then the artist should speci-

fy a finish suggestive of sturdiness and repose rather than of speed of movement. But if this rectangle is the basic form of a vehicle, then the fault lies not with the artist-finisher, but with the designer or engineer. The product should be redesigned along lines that will suggest, if not actually facilitate, movement. It is not enough that the mechanical parts function properly, but that function should be expressed in both design and finish.

Aside from mere beauty, there is a very practical reason for functionalism in design and finish. For example, an oil stove built with legs that are slender, tapering, and delicately curved, may be sturdy and firm enough for all practical purposes. But the chances are the

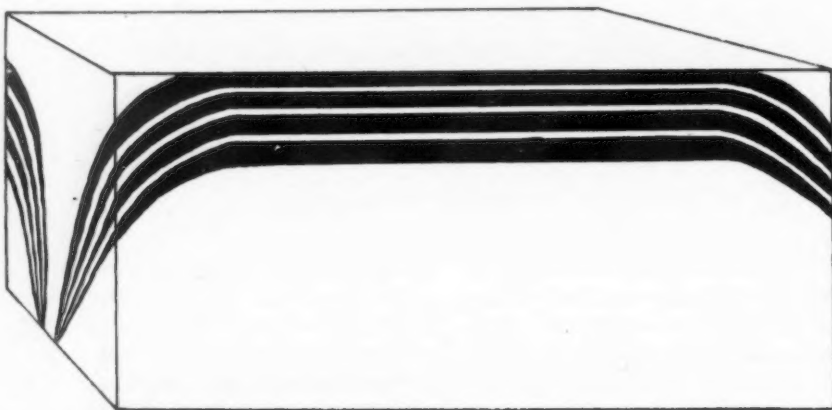


FIG. 1—It is possible to give a rectangular box a streamlined effect by using lines such as those shown here. However, the shape is opposed to movement, and the streamlining effect may have a definite disadvantage.

# Design and Finish

legs will *look* weak and inadequate, however strong they may be from a structural standpoint. The prospective customer, seeing such a stove, is likely to think: "If it ever upsets, it will start a fire." He will think that because the design of the legs has *suggested* that possibility to him. So, immediately, a mental obstacle is placed in the path of a sale.

One manufacturer of oil stoves, faced with this objection, redesigned his stove and eliminated legs entirely by bringing down the two end panels vertically to the floor. This was good functional designing, for the function of an oil stove is not merely to cook rural meals, but to do so *safely*. It must inspire confidence, and confidence should be built into the design.

Confidence, as well as cheerfulness, was further inspired by the finish. This, in place of the dingy, old-fashioned black, was made a glistening white with chrome and black plastic handles as an enlivening contrast. The white suggested sanitation, so necessary where food is prepared, and eliminated the chance of sooty, dirty oil collecting unnoticed, as it frequently does against a darker background.

The design of this stove was simplified as well as functionalized.

There is a second point in modern design and finish, viz., simplification of form. Promiscuous ornamentation has no place in modern machinery or equipment. Only functional ornamentation should be employed. Aside from ornamentation, however, there are frequently several separate parts that could be advantageously combined to form one unit, thus simplifying not only the design, but also the manufacturing processes. Many a product engineer, working toward greater eye-appeal, has, in so doing, opened the way to lower production costs through structural simplification.

## Simple Forms Desirable

Units that "stick out" from the main shape should, if possible, be eliminated or included in the main structure. An example of this is the oil stove mentioned above. The fuel tank originally projected from the frame, making an unsightly unit. In the new design this tank was contained within the frame, and projected only when the operator opened a lift-up door in the end panel.

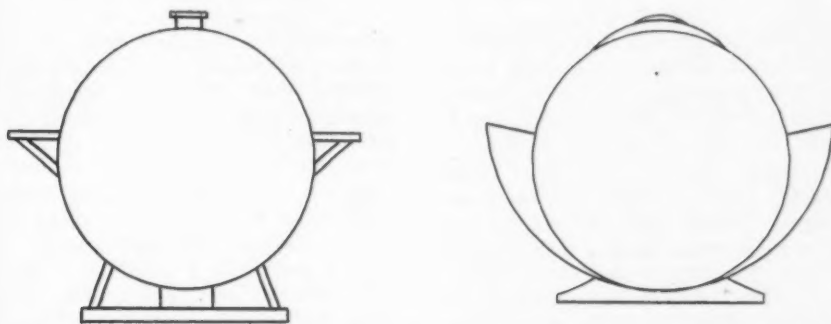


FIG. 2—Where attachments to a machine are necessary, they should not radically depart from the main shape of the product. For instance, the design on the left is poor, whereas that on the right is attractive because the subordinate lines are in accord with the dominant shape.

Usually, simplification will lower finishing as well as production costs, since in the simplified product there are either fewer units to be finished or fewer irregularly shaped pieces requiring greater attention.

Simple forms have greater eye-appeal than complex, involved forms, and this is particularly true of utilitarian products. Just as the mind is bored by technicalities it does not understand, so the eye is tired by complex shapes it cannot grasp without effort.

A third point to be considered in the effective designing of machinery and equipment is this: Subordinate lines should be made to accord with dominant shape.

Where attachments are necessary they should not radically depart from the main shape of the product. Such forms as straight lines protruding from curved surfaces are objectionable, as shown in Fig. 2.

Sometimes, of course, it is necessary to employ straight lines against curved backgrounds, and where such is the case they should be radial or tangential if at all possible.

A fourth point to keep in mind is shape. Pure shape alone has psychological values which should not be ignored. For some possibly obscure reason the eye prefers one certain definite rectangular shape above all others. In this rectangle the short side is to the long side as the long side is to the sum of the two sides. This has, for years, been called "The Golden Proportion," and any ratio that approaches it becomes increasingly satisfactory, so far as the esthetic value of its shape is concerned.

Horizontal lines are passive, vertical lines active. The former suggest rest, the latter support. However, if vertical lines are used in a shape that is excessively high and narrow, the effect will be one of weakness. The vertical (supporting) lines will seem too long and slender to give the support that the mind (not the object itself) demands.

In designing machinery or equipment with sales appeal, it is necessary to consider not only the mechanical but also the psychological requirements.

Color is a fifth point which should be given careful consideration. Like shape, color has certain

(CONTINUED ON PAGE 114)



# ***THIS WEEK ON THE ASSEMBLY LINE***



*... Continued sales spurt tempts manufacturers to increase May schedules over April.*

o o o

*... Chevrolet April sales set new all-time high for any month.*

o o o

*... Used car inventory control being tried out by Michigan dealers shows great promise of eliminating evils of over-allowance on trade-ins.*

o o o

*... Local body die shops only 50 per cent occupied.*

**D**ETROIT, May 12.—Early estimates of May production seem to have been too low and it will not be surprising to find by the time the month is out, that this month's production will have exceeded that of April, which topped 500,000 units. The Automobile Manufacturers Association's estimate of member company production for April is 388,165 units, which would bring the total for the industry up to 502,000, on the basis of Ford production of about 114,000 units and which would approximately equal April production of last year. Last year, however, saw a drop of almost 30 per cent in May production over April. The biggest part of this drop took place in the first week when production fell off by as much as 21 per cent. Cram's estimate for production for the week ended May 9 is about equal to that of the preceding week and should this level be held, April output should be exceeded.

General Motors sales in April established a new record for cars and trucks. April sales to consumers in the United States amounted to 200,117 units, as against 143,909 in April, 1935. Of this amount, Chevrolet sales alone totalled 134,431 units, setting a new all-time high mark for any single month in the company's history. April production of cars and trucks by Chevrolet was 143,315 units, as compared with 125,888 a year ago, and it is understood that the May schedule will call for 145,000 units or over.

Other General Motors units fared equally well. Pontiac produced 21,046 cars in April, the largest number in any month since 1929. The May production schedule calls for 21,000 or more units. Production schedules of Buick for May have been set at 18,043 units, a boost of approximately 6000 cars over the output originally planned for this month. Approximately

12,000 unfilled orders will carry over from April, and there is a likelihood that May sales will exceed those of the previous month. Even cars in the Cadillac class are selling well. The April volume of that unit was 32 per cent higher than in April 1935. Sales made in the last ten days of the month have not been equalled since 1929. Similar records have been shown by Hudson, which made a gain in sales during the last week in April of 18 per cent over the preceding week. Studebaker also reports the largest April sales in eight years and a gain of 63 per cent over April, 1935. Chrysler plans 115,000 units in May, a record.

## **Better Than Anticipated**

From all these reports it is obvious that the automobile manufacturers are enjoying sales activities far in excess of earlier anticipations, particularly when it is considered that the models were introduced a full seven months ago. This first experimental year under the November introduction plan has been more successful than was at first anticipated. As a means of stabilizing employment it has received the recognition of the American Trade Association Executives. It was particularly apropos that the Certificate of Honorable Recognition should have been presented by Secretary of Commerce Roper, who indicated the increase in weekly payrolls registered during the fourth quarter of 1935 amounted to almost 50 per cent over the preceding year. As a result, average annual earnings of automobile factory workers registered a 30 per cent increase over 1934.

While the November introductions have been a boon to the automotive workers and to the fac-



By FRANK J. OLIVER  
Detroit Editor, *The Iron Age*



tories, they have created new problems for the dealer organizations. The public proved that it would purchase new models during the winter months. Used car buyers, however, showed a reluctance to follow suit. As a result, heavy stocks of used merchandise were left on the dealers' hands and the carrying charges absorbed practically all of the retail profit. Much of these stocks consist of "hold-overs" taken at high prices—held in the hope of disposing of them at better than market prices this spring. Now dealer trade executives fear that unless trade allowances on current new car sales are brought down so that retail prices of used cars will be sufficiently attractive to insure a 30-day turnover of stocks, dealers will be caught with more hold-overs, with mid-summer sluggishness just around the corner. If fall model introduction of new cars is to continue and the better class of dealers is not to become extinct, used car allowances must be brought under control to conform to seasonal changes.

#### The Used Car Problem Is Attacked

Bringing trade allowances down seems like a big order. Last January the National Automobile Dealers Association had a grand scheme of having each dealer pledge himself to 20 per cent profit on each used car turnover, the system to be audited by the manufacturers. The dealers all thought it a fine idea, but the manufacturers could not see themselves acting as the enforcing agency. Now comes along a much sounder proposal recently inaugurated by the Michigan Automotive Trade Association. It is known as the Used Car Inventory Control System and has been tried out experi-

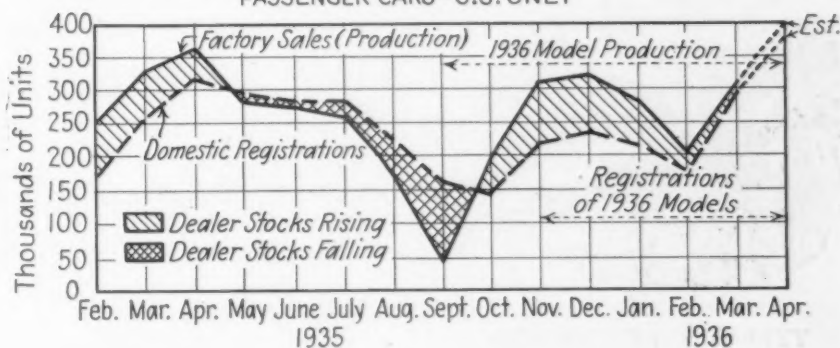
mentally in the western part of the state. Whereas the N.A.D.A. scheme exists at present only in theory, this new plan actually has been put to work. It not only has put used car trading on a profitable basis, but has increased new car sales in these regions as compared with surrounding territory. The manufacturers have not definitely committed themselves but they have placed no obstacles in the way thus far.

What this system proposes to do is to organize dealers on a voluntary basis into local associations pledged primarily to promote and encourage the sale of automobiles by adhering strictly to an average market price on used car allowances. Using the monthly average prices in the Official Used Car Guide of the N.A.D.A., the governing committee permits no dealer to allow more than 20 per cent above the average value given for each model. These figures represent actual average selling prices over a wide territory and give an accurate index of the going market price. Special provisions are made for truck appraisals. Orders

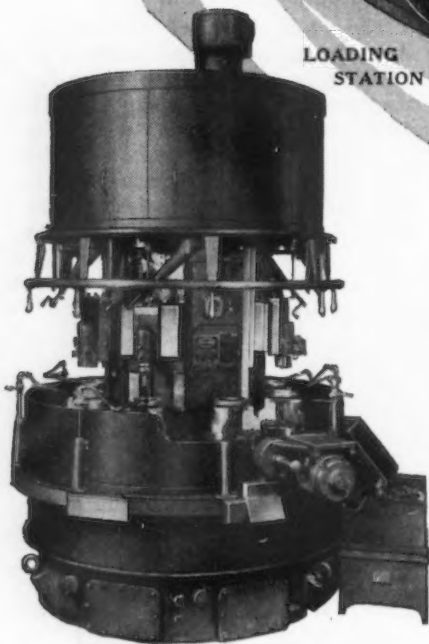
for new cars are made out on standard forms with full information on the trade-in allowance. A paid officer, known as the director of sales, each day collects copies of these orders, which are signed under oath (\$1.00 fee) and reports any violations to the administrative committee. Records are kept of all "clean sales" (no trade-ins) showing to whom the owner sold his used car, in order to prevent collusion between a new-car dealer and a used-car dealer. Penalties range from \$25.00 for first violation up to \$100.00 for the fourth. Repeaters may be expelled from the organization and be termed outlaws. These penalties are strong enough to demand the respect of the most inveterate chiseler, yet weak enough to hold the organization together.

The plan does not violate the Anti-Trust laws nor state laws regarding free competition, since the appraisals are high enough to allow competition, and no make of car is excluded. Unlike the N.R.A. used-car price code, it is enforced by the dealers themselves. Furthermore, the system

RELATION OF FACTORY SALES TO DEALERS AND REGISTRATIONS  
PASSENGER CARS—U.S. ONLY



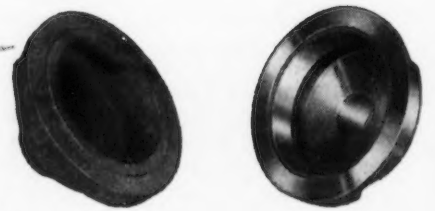
# 7 Machining Operations Simultaneously



TYPE D MULT-AU-MATIC  
ON DIFFERENTIAL GEAR CASE

The Mult - Au - Matic Method provides manufacturing Efficiency and Economy through effective Savings.

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BRIDGEPORT, CONN.



where tried out has the support of the financing companies and the banks, both of which have very much at stake if a dealer is forced to the wall because of malpractice in handling used-car trade-ins. It is an honor system, as each dealer and salesman is indirectly responsible for enforcement and is obliged to report all violations.

#### Effects of the Plan

A plan of this kind, if generally used, will have two effects: it will make the new car salesman a better used car *buyer* and it will put new car selling more strictly on the basis of the particular merits of the car, rather than on the allowance the dealer will give. On the other hand, the appeal of the used car will still be "price," but price at a profit. When used cars are bought at prices that will permit the dealer to add reconditioning and handling expenses and at the same time sell the cars at prices that will represent a saving as against the purchase of a new car, then used car sales will keep pace with new car output.

The interesting thing is that in cities where the plan is being followed, there is actually a shortage of used cars for resale today. Used car stocks have moved freely because the dealer could offer them at attractive prices—which is the main appeal in a used car—and still make a profit. As a result of the plan it is expected that there

will be a purging of the retail end of the business and that the gyp dealer will have to reform or quit the trade.

#### 1937 Models

Probably because the manufacturers are selling their present models at such a high rate, they have put off until the last moment commitments for the new cars, as far as body dies are concerned. While there has been a great deal of activity among the machinery people since the first of the year in connection with mechanical changes, the die shops in the city have been waiting patiently for business to break. Because of the fact that there were so few changes in body design for 1936, it has been expected that this year rather complete changes would be made in other than radiator grilles, but only Fisher Body seems to have made up its mind sufficiently to job out a lot of work, particularly in connection with the turret top and large body panels. Chrysler has placed very little business to date among the job shops, as has Ford, with the exception of Lincoln, which has recently let a few contracts for dies on the large models. The few big jobbing shops in the city who have large Keller machines are fairly well occupied at the present time, but the jobbing manufacturers as a whole are only operating at 50 per cent of capacity. A great deal of miscellaneous small work is expected to be

let within the next few weeks, however, and the shops are looking forward to a very active three or four months.

#### Deliveries

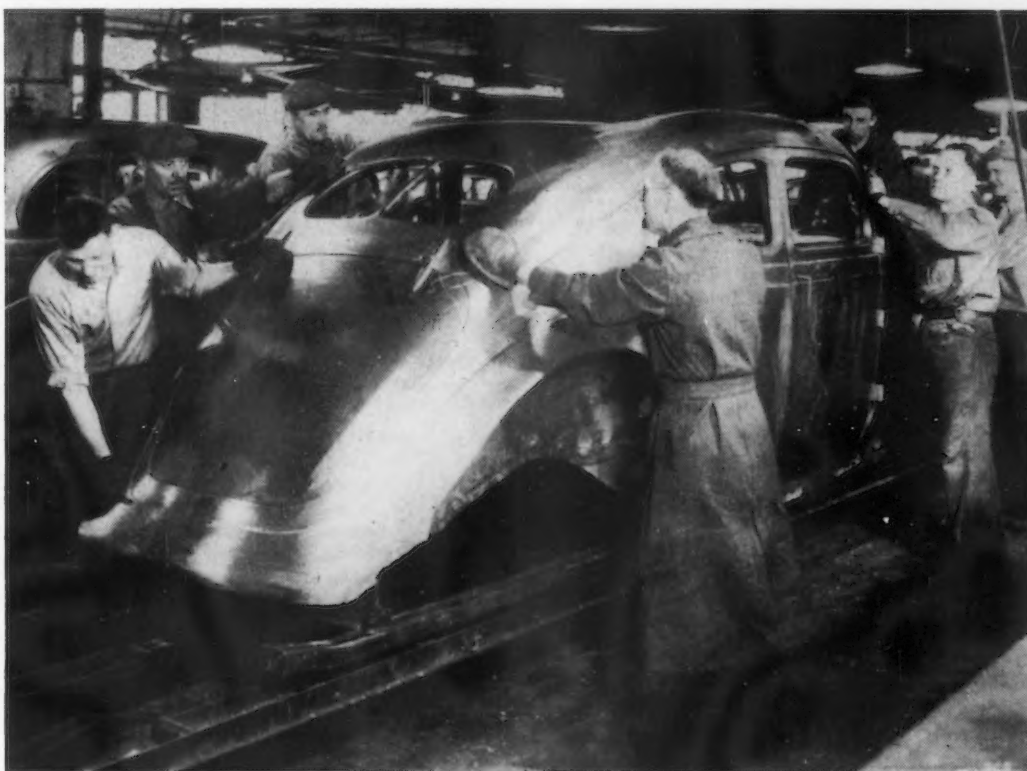
Although deliveries on machine tools ordered at the present time are running up to three months from this date, there are still a great deal of closures to be made on proposals that have been up for several months, as well as those that have just recently been offered by the machinery manufacturers. Purchases for production machinery on the Packard low-priced car are still coming through painfully slow and there is no question but that this car will probably be timed with the November Show, although earlier indications were that the announcement might be sooner. One wonders why Packard should attempt to enter the lower-priced field after such a successful year with the 120. The explanation seems to be that in former years, Packard cars were sold through dealers located only in the larger cities. The introduction of the 120 permitted dealerships to be set up in medium-sized cities, but in those of smaller population it was found that the dealer had to have some other line to sell with a faster turnover, in order to maintain himself in business. Through these enlarged dealer channels, it is expected that it will be possible to produce and sell 50 more 120 cars a day.

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**I**N the final inspection of bodies "in the white," a highly developed sense of touch aided by a special mitten is necessary to detect variations in smoothness, invisible to the eye. It is essential that these high or low spots be eliminated before the body is painted, as even minute hollows will be visible when the finish is polished.

Photo by Chrysler

o o o





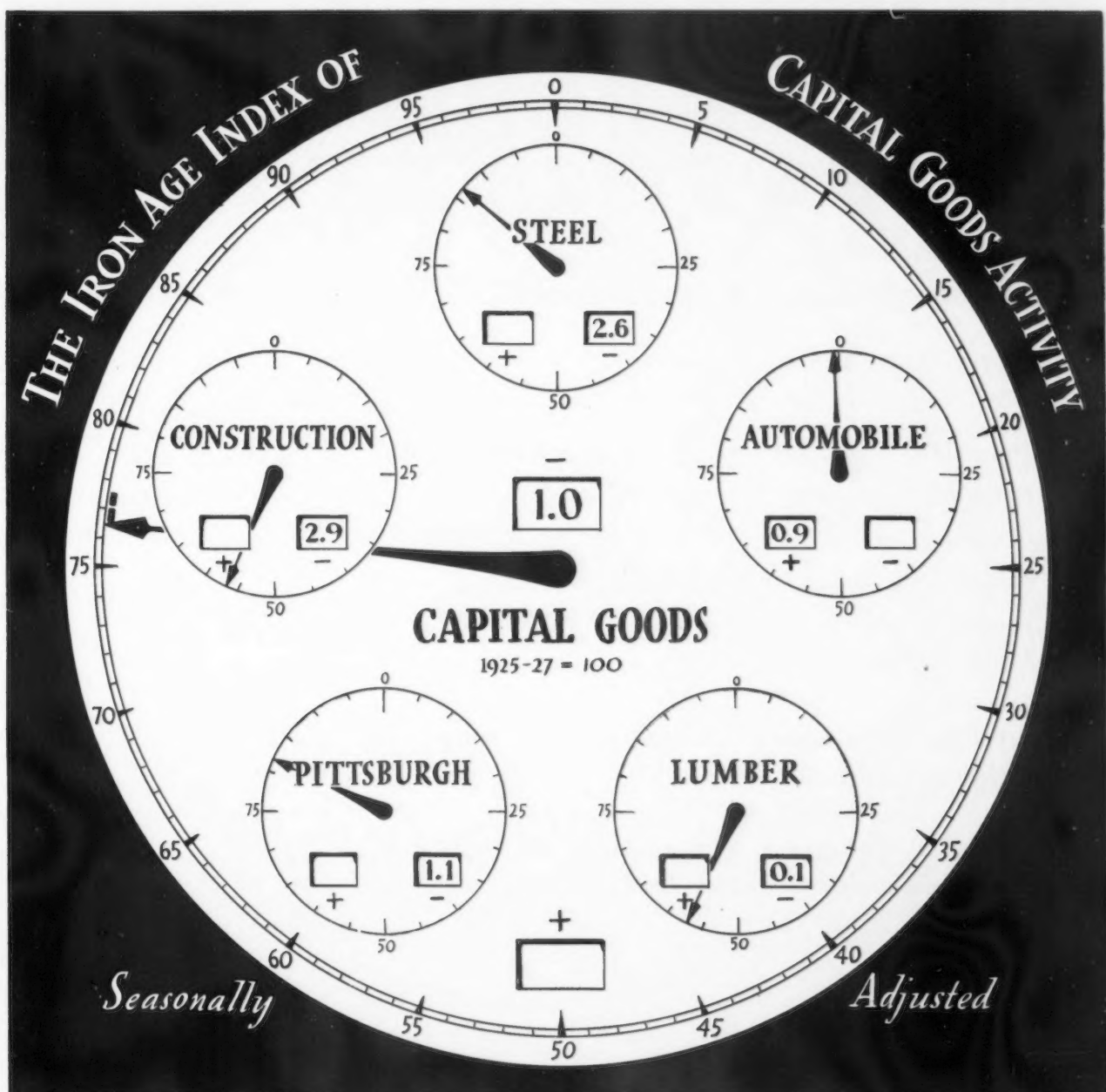
# Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	April, 1936	March, 1936	April, 1935	Four Months, 1935	Four Months, 1936
<b>Raw Materials:</b>					
Lake ore consumption (gross tons) <sup>a</sup> .....	.....	2,897,867	2,360,002	9,690,650	.....
Coke production (net tons) <sup>b</sup> .....	.....	.....	2,736,723	11,512,399	.....
<b>Pig Iron:</b>					
Pig iron output—monthly (gross tons) <sup>c</sup> .....	2,403,683	2,040,311	1,663,475	6,519,391	8,293,585
Pig iron output—daily (gross tons) <sup>c</sup> .....	80,125	65,816	55,449	54,328	68,542
<b>Castings:</b>					
Malleable castings—production (net tons) <sup>d</sup> ....	.....	45,378	42,035	169,620	.....
Malleable castings—orders (net tons) <sup>d</sup> .....	.....	47,844	37,394	163,424	.....
Steel castings—production (net tons) <sup>d</sup> .....	.....	51,674	31,952	122,614	.....
Steel castings—orders (net tons) <sup>d</sup> .....	.....	71,341	28,233	123,030	.....
<b>Steel Ingots:</b>					
Steel ingot production—monthly (gross tons) <sup>e</sup> ...	3,942,254	*3,342,619	‡2,640,602	‡11,150,326	13,295,237
Steel ingot production—daily (gross tons) <sup>e</sup> ....	151,625	*128,562	‡101,562	‡108,256	127,839
Steel ingot production—per cent of capacity <sup>e</sup> ...	69.09	*58.58	‡45.88	‡48.9	58.25
<b>Finished Steel:</b>					
Trackwork shipments (net tons) <sup>g</sup> .....	7,031	6,258	4,472	13,137	20,771
Steel rail orders (gross tons) <sup>g</sup> .....	150,057	62,300	14,000	224,592	574,348
Sheet steel sales (net tons) <sup>g</sup> .....	.....	251,818	168,093	866,303	.....
Sheet steel production (net tons) <sup>g</sup> .....	.....	207,820	209,219	891,077	.....
Fabricated shape orders (net tons) <sup>g</sup> .....	.....	104,868	95,380	337,852	.....
Fabricated shape shipments (net tons) <sup>g</sup> .....	.....	102,478	85,629	328,915	.....
Fabricated plate orders (net tons) <sup>g</sup> .....	.....	29,787	13,244	63,918	.....
Reinforcing bar awards (net tons) <sup>g</sup> .....	26,700	24,025	30,490	87,840	142,365
U. S. Steel Corp. shipments (tons) <sup>h</sup> .....	.....	783,552	591,728	2,376,976	.....
Ohio River steel shipments (net tons) <sup>i</sup> .....	.....	116,510	57,825	249,922	.....
<b>Fabricated Products:</b>					
Automobile production, U. S. and Canada <sup>k</sup> ....	.....	442,545	501,812	1,610,753	.....
Construction contracts, 37 Eastern States <sup>l</sup> ....	.....	\$199,028,300	\$124,020,000	\$421,884,500	.....
Steel barrel shipments (number) <sup>d</sup> .....	.....	648,165	610,848	1,977,132	.....
Steel furniture shipments (dollars) <sup>d</sup> .....	.....	\$1,585,800	\$1,122,987	\$4,547,236	.....
Steel boiler orders (sq. ft.) <sup>d</sup> .....	.....	589,676	315,562	1,638,134	.....
Locomotive orders (number) <sup>m</sup> .....	15	13	2	11	88
Freight car orders (number) <sup>m</sup> .....	3,650	627	600	1,430	12,557
Machine tool index <sup>n</sup> .....	.....	105.3	65.6	‡60.3	.....
Foundry equipment index <sup>o</sup> .....	.....	115.0	113.2	‡86.0	.....
<b>Foreign Trade:</b>					
Total iron and steel imports (gross tons) <sup>p</sup> ....	.....	56,720	28,866	101,964	.....
Imports of pig iron (gross tons) <sup>p</sup> .....	.....	23,743	8,247	23,729	.....
Imports of all rolled steel (gross tons) <sup>p</sup> .....	.....	22,046	13,566	54,355	.....
Total iron and steel exports (gross tons) <sup>p</sup> ....	.....	264,337	205,336	1,019,648	.....
Exports of all rolled steel (gross tons) <sup>p</sup> .....	.....	92,606	64,625	283,833	.....
Exports of finished steel (gross tons) <sup>p</sup> .....	.....	86,676	54,034	247,850	.....
Exports of scrap (gross tons) <sup>p</sup> .....	.....	163,295	131,731	691,419	.....
<b>British Production:</b>					
British pig iron production (gross tons) <sup>r</sup> .....	629,800	633,600	526,300	2,084,800	2,444,000
British steel ingot production (gross tons) <sup>r</sup> ....	991,500	980,100	808,700	3,177,900	3,822,600
<b>Non-Ferrous Metals:</b>					
Lead production (net tons) <sup>s</sup> .....	.....	35,150	32,389	122,119	.....
Lead shipments (net tons) <sup>s</sup> .....	.....	36,743	40,922	136,113	.....
Zinc production (net tons) <sup>t</sup> .....	43,252	42,483	35,329	140,667	163,880
Zinc shipments (net tons) <sup>t</sup> .....	42,311	38,159	38,455	149,992	166,856
Deliveries of tin (gross tons) <sup>v</sup> .....	6,235	5,520	5,825	19,825	23,990

\* Revised. † Three months' average. ‡ Adjusted.

Source of figures: <sup>a</sup> Lake Superior Iron Ore Association; <sup>b</sup> Bureau of Mines; <sup>c</sup> THE IRON AGE; <sup>d</sup> Bureau of the Census; <sup>e</sup> American Iron and Steel Institute; <sup>f</sup> National Association of Flat-Rolled Steel Manufacturers; <sup>g</sup> American Institute of Steel Construction; <sup>h</sup> United States Steel Corp.; <sup>i</sup> United States Engineer, Pittsburgh; <sup>j</sup> When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; <sup>k</sup> F. W. Dodge Corp.; <sup>l</sup> Railway Age; <sup>m</sup> National Machine Tool Builders Association; <sup>n</sup> Foundry Equipment Manufacturers Association; <sup>o</sup> Department of Commerce; <sup>p</sup> British Iron and Steel Federation; <sup>q</sup> American Bureau of Metal Statistics; <sup>r</sup> American Zinc Institute, Inc.; <sup>s</sup> New York Commodities Exchange.



Same Week Last Month	Preceding Week	Last Week
74.5	77.5	76.5
85.1	89.3	86.7
94.6	98.4	99.3
51.1	57.0	56.9
73.1	82.9	81.8
68.7	59.5*	56.6

\* Revised.

AFTER having risen for five successive weeks, THE IRON AGE weekly index of activity in capital goods has suffered a reverse. Last week the index declined one point to 76.5 per cent of the 1925-'27 "normal." Reduced steel mill operations, following recent unusual activity, were important in lowering the index, but other factors concurred. Conspicuous losers included the index of the volume of heavy engineering construction and the index of industrial production in the Pittsburgh area. The latter showed a moderate contra-sea-

sonal decline, but is still setting a standard for earlier year comparison.

Motor car output at Detroit, by rising slightly last week, contradicted the normal seasonal movement at this time and placed the automobile index somewhat higher. Volume of lumber shipped during the week showed little change.

The index's combined value totals 23 points in excess of its comparable showing last year, and apparently there is little danger of 1936 losing its advantage for some months ahead.

COMBINED INDEX	
Steel Ingot Production	57.0
Automobile Production	75.3
Lumber Shipments	43.2
Pittsburgh Industrial Production	57.2
Heavy Engineering Construction	35.0

Same Week 1935	Same Week 1934	Same Week 1933
53.5	70.0	39.0
57.0	74.6	43.0
75.3	63.1	40.1
43.2	61.9	39.8
57.2	69.2	43.6
35.0	35.6	27.5

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Cram's Reports, Inc.; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from Engineering News-Record.



*... President seeks revival of low-cost housing and railroad equipment industries.*

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*... Organized labor reverses time-honored non-partisan policy as William Green caresses the hand that feeds him.*

o o o

*... Steel industry becomes center of increasing row in labor ranks.*

o o o

*... Canadian duties on steel imports from United States are reduced in line with treaty.*

o o o

By L. W. MOFFETT  
Resident Washington Editor,  
The Iron Age

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WASHINGTON, May 12.—Having in mind the Administration's desire that private industry absorb employment, the President is continuing discussions with industrialists. His statement to the press last Friday, prompted by inquiries, that he had conferred during the week with Owen D. Young, chairman, General Electric Co., Walter P. Chrysler, chairman, Chrysler Corp., and Bernard M. Baruch, financier, gave rise to report that the undertaking was something new. Actually the President long has been holding such conferences and the White House did not pretend that it had developed a new plan by which private industry could absorb employment.

The present conferences have related especially to expansion in the railroad equipment and low-cost housing fields. The President said the expansion in these two fields is being blocked, although there are large needs in both. The obstacle in the way of purchases of much-needed railroad equipment, it was stated, is the capital structure of some railroads. In the field of low-cost housing the obstacle was said to be the necessity of earning fixed charges. No plans for Government loans to railroads are being considered. The aim being considered in the way of low-cost housing is developing mass production so that homes can be built at a cost of approximately \$2,500. Legislation is now pending, though it is far from being definitely agreed upon, looking to a slum clearance and low-cost housing projects.

The President was asked if provisions in the pending tax bill would hamper railroads which otherwise might divert earnings to railroad equipment purchases. It

was indicated that the matter had not as yet been settled.

▼ ▼ ▼

### **Organized Labor in Politics**

Breaking from its traditional non-partisan policy, organized labor has plunged into politics up to its neck. . . . And some of its adherents are afraid lest it will be engulfed over its head and sunk. . . . The latter view is that of craft unionists who are further mightily bedeviled by the battering administered at the hands of industrial unionists under the hard driving of John L. Lewis and his Committee for Industrial Organization. . . . It is being administered so stingingly that President William Green of the American Federation of Labor, desperately seeking to tighten his feeble hold on the rift-ridden organization, did a quick somersault such as has been seen rarely, if ever before, in the annals of labor history. . . .

Pursuing the course of his astute predecessor, Samuel Gompers, Mr. Green had circularized organized labor throughout the land to take no part in politics. . . . He warned that to do so would threaten disruption of organized labor. . . . But hardly had this message reached its destinations when Mr. Green did a fancy handspring and flopped himself onto the bandwagon and alighted alongside, rather unwelcomely, it is suspected, the forces of the C. I. O., and "Industry Coordinator" George L. Berry's "Non-Partisan" Labor League, which are definitely committed to and aggressively campaigning for the reelection of President Franklin Delano Roosevelt. . . . The non-coordinating "industry coordinator" is financing his campaign from WPA funds taken from the forgotten man as a taxpayer. . . .

Mr. Green's *volte-face* and direct plea for the reelection of Presi-



# **You can meet** *Any of Today's Requirements* **With a HEALD**

Today, manufacturing requirements on units with moving parts call for the greatest of accuracy in order to obtain longer life, quietness and the most efficient operation. The securing of these results depends largely on the hole finishing and facing operations of the various parts.

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the widest range of work imaginable or a single operation on a multitude of parts, somewhere in the Heald Precision Grinding and Boring Line is just the machine for you.

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**U. S. A.**



dent Roosevelt was made in the course of an address on Tuesday of last week before the twelfth convention of the National Women's Trade Union League of America. . . . "We have been inspired and thrilled by the leadership destiny has given us," said Mr. Green in his best style of dramatic oratory, which is pretty good at times. "We want to continue it." . . . When asked if his declaration meant he was supporting the President for reelection, Mr. Green replied that "no other interpretation can be placed upon it." . . . His remark, so it was pointed out, was not made "officially" as head of the A. F. of L., but it left nothing to the imagination. . . . It was a definite reversal of the traditional policy of the A. F. of L. Mr. Green had just set forth in his circular warning against partisan politics and a bid to the A. F. of L. membership to fall actively into partisan politics and support President Roosevelt. . . .

Not being "official," however, it perhaps left a loophole to crawl through if attack came from that part of the membership which still sticks to belief that organized labor's greatest strength lies in its force as a sort of balance of power, largely theoretical though it has been, throwing its political support to candidates considered to be most favorable to organized labor's interests. . . .

Actually, of course, organized labor never has voted as a unit. . . . But it promises to come more nearly to doing so during the present campaign than ever before. . . . Indications, some of them quite concrete, are that the bulk of organized labor's vote will go to President Roosevelt in return for labor legislation he has forced on the statute books, some taken off by the courts and more likely to be taken off, however. . . . It will also anticipate further legislation being sponsored by organized labor, in the event of Mr. Roosevelt's perpetuation as chief executive. . . .

Mr. Green realized fully that he was "on the spot" when he faced about. . . . He saw the breaks in the rank and file of the A. F. of L. under the high pressure of his industrial union antagonists, Mr. Lewis and his C. I. O., their boring from within in the Amalgamated Association of Iron, Steel and Tin Workers in its effort to organize the steel industry vertically, and the shift toward this move as the Executive Council of the A. F. of L. has gathered in Washington. . . . The rank and file of organized labor shortly before at meetings of state federations in Pennsylvania, Georgia, Kentucky and Alabama pledged to cooperate with Berry's

"Non-Partisan" League and Lewis's C. I. O. . . .

It is no secret that the industrialist unionists are anxious to unseat Mr. Green as head of the A. F. of L. . . . They expect to do so, seize the reins of the A. F. of L., enlarge and transform it into an industrial union organization. . . . However, craft unionists think the organization would be disrupted, for there are determined fighters in the craft union ranks, just as capable as Mr. Lewis and other members of the C. I. O., but admittedly without the organized strength Mr. Lewis and probably others of the committee have with strong unions back of them. . . . Yet the craft union membership

still exceeds that of the industrial union membership. . . . And as a cross-section, it is smarter than the industrial membership. . . .

Many who are sympathetic with organized labor think it has endangered its power greatly, and perhaps fatally, by turning to partisan politics. . . . They think that, regardless of changes that have taken place meanwhile, it would have been wise to adhere to its traditional non-partisan policy by which it sought to play one candidate against another with the labor vote as a prize—imaginary oftentimes. . . . They think, too, and even more importantly that the turning to partisan politics will inevitably mean a schism within the



**a character worth knowing**



ranks of organized labor against which Mr. Green has so persistently warned just as Mr. Gompers had done before him. . . . The difference is that Mr. Gompers stuck to his guns. . . . Yet on the one occasion when organized labor did commit itself to a Presidential candidate (LaFollette) it got nowhere and did not suffer a schism. . . . Its membership always has voted precisely as it pleased and actually has shown a bias in favor of the Republican party. . . . Organized labor also has tried in the past without success to unite the farmer and labor vote. . . . And again it has been unable to break voters into groups, finding that farmers, bankers, business men and profes-

sional, like laborers, have their personal choices and do not vote en bloc. . . . It will be conceded, however, that thanks to huge gratuities given by the New Deal to farmers (also at the expense of taxpayers) and its sponsorship of organized labor legislation, it may expect a strong farmer-organized labor vote. . . . On the other hand, organized labor represents only a small portion of the country's labor and, despite the efforts at unionization, it has made comparatively small headway and this means that it cannot dictate to labor as a whole as to how it will vote. . . . The political importance of organized labor's support has been much over-emphasized. . . .

The C. I. O., of course, has visions of drawing unorganized labor within its ranks, much of it, it is hoped, in time to vote for President Roosevelt. . . . But there are those who think it is only a vision, despite claims that it is finding employee representation unions in steel and other industries a fruitful field where the latter are ready and even eager to be embraced by the organized labor industrial unions. . . . It is clear there is much of a pipe dream in a great deal of this thinking, but just how much reality there may be is a question. . . .

As to the contention that partisan politics are threatening organizer labor, the answer is that it is launching on a campaign to set up a labor party. . . . This is not new, but the move under way undoubtedly has more force back of it than ever before. . . . And there is even serious discussion among his followers of putting forth Mr. Lewis as labor's candidate for President in 1940! . . .



### **Steel Industry Is Focal Point**

Meanwhile, the much-talked-of organization of the steel industry is the focal point of the intensified row between the industrial and craft unionists, centering around the Amalgamated Association of Iron, Steel and Tin Workers. . . . The morsel sought eagerly by both factions, it has been put up to that organization whether it will remain with its parent body, the A. F. of L., or break from its old moorings and accept the proposal of Lewis's C. I. O. to "cooperate" with the latter, with a backing of \$500,000, and organize the steel industry along strictly vertical lines. . . . The issue was brought to a head at Washington last week at the meeting of the executive council of the A. F. of L., and, unless President Green or Mr. Lewis retreats, which neither apparently will do, it will have to be decided by the end of the present week. . . . Organization of the steel industry "immediately" was determined upon by the council after heated discussion over the industrial-craft union question, and since the council has only one industrial union member, it decided that it must "exercise the right to manage, promote and conduct the campaign," as President Green telegraphed the Amalgamated association last Friday, in convention at Canonsburg, Pa. . . . "There can be no division in administration and conflict in authority recognized in the conduct and administration of the organizing campaign," the council declared. . . . Mr. Green said that



**L**HIS old fellow — just turned 87 — is a real New Englander. Born and raised in Windsor, Vermont he's seen a great deal of history in the making. In 1849, right in his home town, the firm of Robbins & Lawrence was doing a brisk business in arming the '49ers, and started building their own machine tools. He worked in this shop in his youth, and at 25 he followed the firm to Springfield, Vermont where it became the Jones & Lamson Machine Company. Figures come a little slow to him now, but thinking back to the first turret lathe that Robbins & Lawrence built — "Yes, sir, ever since the year I was born they've been building turret lathes, and I just turned 87. I've seen the spirit of pioneering carried on with each new development, and I'll say this — 'there isn't a finer turret lathe built; with the design, materials, and workmanship that goes into them, there couldn't be.'"

J&L is proud of its history, naturally, but prouder still that its 101 years of activity and development should be manifest in its present line of lathes and other products.

J&L and its products have characteristics worth knowing. A general catalogue, showing the complete line of J&L products with a history of the company will be sent on request.



if the Amalgamated association accepted the proposition of the A. F. of L. organization headquarters will be set up within two weeks at Pittsburgh and Gary. . . . "We will begin the drive as soon as the executive council completes its session at the end of next (this) week," he added. . . . The Amalgamated association, he declared, would be given "broad jurisdiction," but he insisted that its craft union rights must be respected. . . . John P. Frey, the fighting head of the metals trade union of the A. F. of L., struck out vigorously against the C. I. O., while Lewis again scorned the A. F. of L. efforts to organize the steel industry. . . . He said the A. F. of L.'s offer to bring workers in the industry into its

union is a "rehash of ancient and futile resolutions" adopted at intervals by the A. F. of L. executive council. . . . Mr. Lewis had also telegraphed to the Amalgamated association convention in Canonsburg that he was prepared to provide \$500,000 if the Amalgamated association would go along with the C. I. O. . . . He declared that if the Amalgamated association accepted the executive council's proposal to organize a craft union the steel industry would be filled with "a horde of organizers freely competing with each other for the new members who might be organized for the few dollars which might be taken in as the initiation fees and dues collections." . . .

This row, whatever its propor-

tions may reach, raged as the Canonsburg convention adopted a resolution calling for a wage increase of 15 per cent to be written into new contracts made by the Amalgamated association with steel manufacturers for this year. . . . In view of past unsuccessful efforts to organize the steel industry, there is a doubt that the present move will get very far despite claims of both craft and industrialist unionists that large numbers of employee representation organizations are prepared to join with organized labor. . . .



### ***Duty Reductions Included in Canadian Budget***

Reductions in duties on American iron and steel products and machinery are provided for in the Canadian budget presented to Parliament May 1. They were made effective provisionally on the day following, subject to approval of Parliament. At the same time some reductions were made applicable only to British iron and steel products for the purpose of improving the competitive position of British producers in the Canadian market. The iron and steel products on which decreases were made applicable only to British products are chiefly in the "not otherwise provided" classification. These include such products as steel drums, tanks, cylinders and hand pumps. On these the British preferential duty was reduced from 15 to 10 per cent while the intermediate duty, applying to the United States and other countries, was left unchanged at 25 per cent.

Hot-rolled strip steel duties were reduced. On strips of less than 0.08 in. in thickness, when imported for manufacture of motor vehicles, the duty applying to the United States was changed from 15 per cent ad valorem to a specific duty of \$4 per ton. On strips above 0.08 in. in thickness, when imported for the manufacture of motor vehicles other than the manufacture of chassis, the duty was reduced from \$8 to \$4. In both sizes the British duties were entirely removed, while previously they were 7½ per cent and \$4 per ton respectively.

On rough machined forgings, fitted or not, the duty applying to the United States was left unchanged at 27½ per cent, while the British duty of 20 per cent was eliminated and these forgings made free of duty. On cold-drawn seamless pipe and tubing, valued at not less than 5c. per lb., the duty applying to the United States was reduced from 27½ to 20 per cent.



**F**EW people realize the wide range of work that can be handled on Blanchard Surface Grinders. The machine illustrated here is the No. 27, the largest Blanchard Grinder made. Wheels range in size from 27 inches to 42 inches. Swing for work is from 60 inches to 96 inches diameter. Look over the large surfaces you machine and see how many come within the capacity of this heavy powerful machine. Send blueprints and let us tell you what the No. 27 can do on this work.

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**THE BLANCHARD MACHINE COMPANY**  
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● **Capacity**—The model B-225H Vertical Hydraulic Feed NATCO Driller shown at the right is built for a variety of applications. It has a rated capacity of one 1¼" drill in steel—or an equal capacity in a larger number of smaller drills.

● **Hydraulic Feed—Simplified Control**—This machine is arranged with a semi-automatic hydraulic feed. The simplified control permits instant and positive control of the head under all conditions.

● **Adjustable Feeding Rate and Feed Lengths**—The feeding rate is easily adjusted as required by means of a valve. The length of the rapid traverse and feed strokes are adjusted by valve trip dogs which are located on the right hand side of the head.

● **Variety of Heads and Spindle Speeds**—This machine may be arranged with a flat slide for the mounting of a single spindle hi-duty head, a slow speed head for boring operations, or a fixed center multiple spindle drill head for high production work. This machine may also be arranged with three different sized adjustable multiple spindle heads equipped with either 8 or 16 spindles. A variety of spindle speeds are provided for all heads.

● **Solid Built-in Table or Adjustable Table**—Either a solid built-in table or an adjustable table can be provided. Both types are arranged with a wide coolant channel and coolant return.

Because of its great flexibility and its simple sturdy design—this machine has proved itself to be a valuable piece of shop equipment.



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# **NATCO** Drilling, Boring, and Tapping Equipment



## Increase Net Profits On Drilling Operations

Use Self-Oiling, All-Geared Drilling Machines to increase net profits on drilling, boring, tapping, reaming, and similar operations. These accurate, powerful, durable, easily operated machines save labor, time, floor space; and they increase production. Their field covers the operations indicated ranging from  $\frac{3}{8}$ " to 4" diameter, and include boring and facing certain larger diameters. Self-Oiling, All-Geared Drilling Machines are built in a wide variety of sizes and types. These include simplified single-purpose machines with pick-off gears for speed- and feed-changes; five sizes with quick-change speeds and feeds; and our heavy-duty Hydram Drilling Machines with hydraulic feed directly over the cutting tools, and adjustable automatic operating cycle. There are attachments and multiple-spindle Auxiliary Heads for our standard machines which increase operating convenience and production. Our Gang Drills are built in any desired combination and number of spindles from 2 to 6. For maximum specialized production at minimum cost our High Production Units with Hydraulic Indexing Table are built to order. Investigate!



Shown above is our No. 262 Sliding Head Drill, a wide-range machine popular for airplane motor building, tool-room work, and maintenance as well as manufacturing operations.

Write Today for Catalog I

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The British duty of 15 per cent was removed and these products also made duty free. There were a number of increases in duties on small tools coming from the United States from a range of 25 per cent to 35 per cent to a flat rate of 35 per cent. At the same time duties on such tools from the British Empire were reduced from a range of 15 to 30 per cent to a flat rate of 10 per cent.

On a wide range of metal-working machinery and other machinery the duties applying to American shipments were left unchanged at 25 and 20 per cent, the former applying to machinery made in Canada and the latter to machinery not made in Canada. On British machinery the duty on products in the former classification was reduced from 15 to 10 per cent, while on such machinery not made

in Canada the duty of 15 per cent was eliminated entirely.

In addition to metal-working machinery this group includes such items as pumps, cranes, derricks, concrete mixers, shoe machinery, pulp and paper mill machinery, steam shovels, coal-handling machines, air-compressing and cement-making machinery.

On printing machinery and equipment from the United States duties ranging from 5 to 27½ per cent were entirely removed and imports of such machinery and equipment from the British Empire remained duty free.

On agricultural implements from the United States the duty of 12½ per cent was reduced to 7½ per cent. Imports of agricultural implements from the British Empire are duty free. Duties on automobiles, motor buses and motor trucks were reduced to a flat rate of 17½ per cent. On the higher priced cars the duty had been 22½ per cent, while rates on buses and trucks were 30 per cent.

The budget provided for a clearer definition as to when a product is to be regarded of "a class or kind made in Canada." The government was given authority to fix the percentage of domestic production of a given product which is to be regarded as "substantial." By reason of this clarification it is expected American manufacturers of machinery now will be able to make shipments under the duty of 20 per cent rather than 25 per cent as heretofore.

A drawback of 99 per cent of the duty on importations of machinery not made in Canada to be used in the production of motor vehicles is provided for in the budget.

A number of the products now made subject to higher duties were reduced to the United States under the general most-favored-nation provision of the Canadian-American reciprocal tariff trade agreement, provisionally effective Jan. 1, but were not among those bound as to the exact amount of duty.



### Labor Department Begins Campaign Against Silicosis

Secretary of Labor Frances Perkins has announced the appointment of four committees in the cooperative campaign to lessen the ravages of silicosis to which 500,000 workers in mines, quarries, foundries, glass works and other industries where silica dust may be inhaled are exposed in some degree.

She recently held a national con-

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ference to lay the groundwork for the first concerted drive against the disease which has taken a heavy toll among wage earners. Representatives of employers, workers, insurance companies, the Government, technical societies, engineers and physicians agreed to cooperate with the Department of Labor in a campaign to end silicosis.

"Silicosis, for which we know no cure, should be prevented" Secretary Perkins said today. "The fact that it has been prevented in certain industries where there is exposure is sufficient grounds for making us believe that it can successfully be combatted in practically all industries and that every effort should be made to study the particular needs and problems of those industries so as to devise ways suitable for the control of the disease.

"The technique of silicosis prevention lies in keeping the dust from getting into the air which workers breathe. This can be done by different types of ventilation—not necessarily general ventilation—but specialized control and collection of the dust at the point of origin so that it does not escape into the workroom.

"The use of wetting down processes is also often helpful. The keeping of rooms clean, the cleaning of walls, floors and machinery is also of assistance. The wearing of positive pressure masks is a possible method of control when nothing else is available, but this is not practicable in most places and under most circumstances. It is difficult for men to do an 8-hour day wearing such a mask, but for certain short-time exposures it may be appropriate.

"Silicosis is caused by breathing very small particles of dust containing silica. The particles which are too small to be seen in the form of dust are the ones which are the most dangerous since, because of their minute size, they reach the small air cells of the lungs, penetrate the lining membranes and cause irritation. This, in turn, causes the replacement of healthy tissue by fibrous or scar tissue.

"The concentration of the dust is another test of the degree of the hazard; also, the length of time a worker has been exposed. A short exposure may not create any particular hazard and may not cause any after-effects in the lung tissue. The degree of concentration of the dust and the length of exposure are extremely important factors.

"The symptoms are not very well known and are extremely difficult for the layman to recognize, also difficult for the physician to recognize; but in general one gets the

picture—a general malaise, shortness of breath, early fatigue, sometimes with some slight visible symptoms, but usually not. The actual recognition and diagnosis of silicosis can scarcely be made without an X-ray examination."



### Testimony Against Tax Bill

In a brief submitted to the Senate Finance Committee opposing the House tax bill Herman H. Lind, general manager, National Machine Tool Builders' Association, pointed out that "the machine

tool industry requires that a complete business cycle be taken into consideration, a cycle covering many years so that just as bad months and quarters of the consumer goods industries are evened off by the good; so the bad years in the machine tool industry may be evened off by the good years."

"This disparity," he said, "has always existed under any method of taxing earnings, including the present one, but our people have accepted the situation without protest and have done their best to provide ahead for their tax burden.

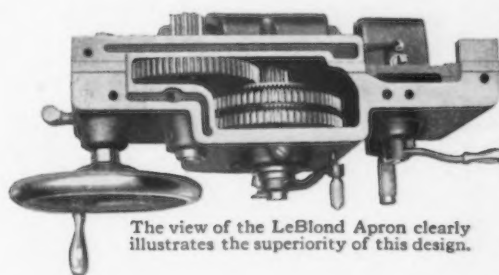
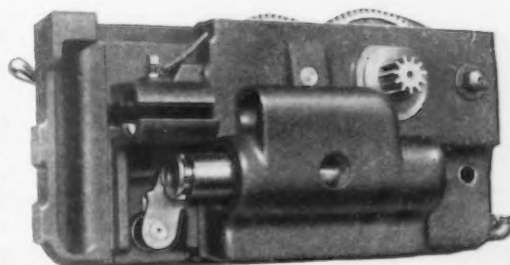
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The Apron is the most modern, improved double walled box type with the lead screw, bevel pinion and half nut brackets cast integral. Under the most severe usage

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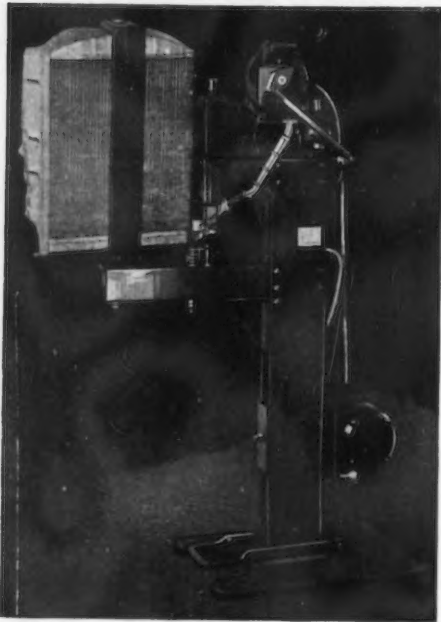
The view of the LeBlond Apron clearly illustrates the superiority of this design.



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The work is placed over the locator in the anvil. The rivet is fed automatically into the jaws which are carried down by the ram. The head is formed underneath the work.

The standard machines are capable of setting (in one stroke) solid rivets up to and including  $\frac{1}{4}$ " in diameter and are available in 4", 8", 12", 14" and 30" throat depths.

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England.*

However, under the plan now proposed the problem of looking out for next year's taxes would be increased and intensified in our opinion.

"We believe the proposed tax plan will curtail our sales even in the best of times when we normally expect to store up earnings for future years. Occasionally machine

tools are bought out of the proceeds of new financing, but by far the greater quantity are purchased out of earnings converted to surplus. We anticipate that the proposal to place a heavy tax on undistributed earnings will mean that plant improvement and expansion by our customers will come about much more slowly than has

been customary, that reemployment dependent upon expansion will be retarded, that the total volume of goods produced will be lowered, and the general flow of business seriously handicapped.

H. W. Story, Allis-Chalmers Mfg. Co., Milwaukee, told the committee that the bill created far more inequities than any past tax bill "or than I could ever conceive." He declared that the theory of the proposed taxation would have no great effect on the well-established companies for the present but that it would tremendously handicap the moderate-sized corporations. The two groups, he stated, are not fairly treated.

Describing the measure as "deliberate economic planning" and "regimentation," Noel Sargent, economist and secretary of the National Association of Manufacturers, asked the Senate Finance Committee today to reject the proposed "dangerous" tax on undistributed corporate earnings.

He suggested that instead of enacting the bill the legislators consider creation of a special committee including representatives of Congress, the Treasury, finance, productive enterprise, and independent tax economists to study the already complex tax structure and submit recommendations to the next Congress.



### **Anti-Basing Point Legislation Postponed**

Senator Wheeler of Montana, chairman of the Committee on Interstate Commerce, told THE IRON AGE yesterday that no further hearings on the Wheeler-Utterback anti-basing point bill have been arranged. The Senator's statement is taken to be further confirmation of the belief that the measure has been dropped entirely, at least for the present session of Congress.

When testimony of steel executives on the measure was completed sometime ago it was proposed to call witnesses from the lumber, and flour interests as well as additional witnesses from the cement industry. The reason for not pursuing this plan has not been disclosed.

It is the general opinion, however, that it was the conclusion of proponents of the legislation that it was doomed to defeat and it was thought doubtful that it could even be reported out of the Senate Committee on Interstate Commerce. This view of supporters of the legislation is said to have developed as the result of testimony presented before the committee by

# GAMMONS TOOLS

## SPIRAL SPECIALISTS

GAMMONS HOLMAN CO. MANCHESTER, CONN.



steel and other witnesses. Their evidence, explaining the actual operation of the basing point system, and the evils that would arise from its abolition, is thought to have distinctly changed the minds of Senators, who at first were inclined to favor the legislation, and to have turned them against it.

There is no prospect that the bill will be considered at all at the present session by the House Committee on Judiciary where it was referred by the House when introduced in the latter body by Representative Utterback of Iowa.

There remains the so-called anti-basing point provision in the so-called priced discrimination bill of Representative Patman of Texas, said to be aimed chiefly at chain stores. Efforts are being made by supporters of this bill to bring it before the House at an early date under a special rule. It is believed this effort will be successful but that before the House votes on it the anti-basing point provision will be struck out.

#### Repeal of Long-and-Short Haul Clause Unlikely

The Pettengill bill providing for repeal of the long-and-short haul clause of the fourth section of the Interstate Commerce act is not expected to emerge from the Senate Committee on Interstate Commerce at the present session of Congress. Although recently passed by the House, where it was sponsored by Representative Pettengill of Indiana, it is strongly opposed by Senator Wheeler, chairman of the Senate committee, which began hearings on the measure yesterday. It will be a simple matter, it is said, to keep the bill before the committee during the short period remaining before adjournment of Congress, if adjournment is taken by June 6, as is expected.

The bill is being strongly supported by the railroads, and railroad brotherhoods and also by many shippers, including iron and steel manufacturers. It would permit the railroads, subject to regulations of the Interstate Commerce Commission, to establish rates for long hauls less than those applying to intermediate points. Under the fourth section as at present applicable, the railroads cannot charge lower rates for longer hauls than for short hauls on the same line in the same direction without special permission from the Interstate Commerce.

Railroad executives told the Senate Committee on Interstate Commerce repeal of the long-and-short haul provision is necessary in order

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to meet water, motor truck, and pipe line and other competition.

Presentation of testimony by the railroads was made through the Association of the American Railroads. They contend that if the long-and-short clause were repealed the railroads would recapture a great amount of traffic. Included in such traffic are large tonnages of iron and steel. Joseph G. Kerr told the committee that if the clause were repealed it could transport, among other products, iron and steel from Pittsburgh, Middletown, Ohio; Chicago, St. Louis, Kansas City, Minnequa, Colo., and other Middle Western States to Texas Gulf Ports, the Pacific Coast and adjacent territories in competition with iron and steel

brought in by water from the North Atlantic Coast and foreign countries. Also he said the railroads would get cast iron pipe tonnage for shipment from Utah to Pacific Coast ports in competition with pipe brought in from other points by water.

The revised simplified practice classification for iron and steel scrap has been announced by the Bureau of Standards and will become effective June 15. The revision covers certain additions and eliminations of classifications which pertain to scrap for blast. Open-hearth and electric furnaces and for gray iron foundry practice. Bessemer converters and for miscellaneous scrap.





## Steel Taxes in 1935 Were Equivalent To Year's Pay for 57,360 Workers

THE tax bill of the American steel industry in 1935 was equivalent to a full year's pay for 57,360 employees. It was equal to \$133, or over five weeks' average pay, for each of the 547,112 employees on the industry's payrolls last year.

During the year a total of almost \$73,000,000 was paid in taxes to Federal, state and local governments by the industry.

These figures are based upon information reported to the American Iron and Steel Institute by 127 companies which in 1935 produced more than 90 per cent of the total output of finished steel in the country. The figures indicate that the industry's tax bill in 1935 was approximately 16 per cent greater than that for 1934, largely reflecting increased payments of Federal income taxes in accordance with improvement in earnings.

One of the interesting facts disclosed by the reports is that taxes paid by the 127 companies were larger by a substantial margin than their earnings which were only \$62,961,961. Moreover, taxes were nearly double the total of \$38,926,401 paid by those companies in dividends to their stockholders.

The year's tax total was equivalent to \$132 for each of the industry's 551,832 stockholders. Dividends actually paid last year averaged \$71 per stockholder.

Although tax payments are not available for all of the 127 companies prior to 1935, figures for 26 of the companies, representing a major part of the total output, have been compiled for the period since 1929. Their total tax bill from 1929 through 1935 aggregates \$455,718,339. This figure is 65.2 per cent of the total income

available during those years for paying taxes and for return on stockholders' investment.

In 1931 and 1934 the tax bills exceeded the income available, with the result that a portion of the taxes was paid from surplus, while in 1932 and 1933 the companies showed an aggregate deficit even before providing for taxes.

Approximately 4.6 per cent of the companies' gross sales and earnings, which have aggregated \$9,809,000,000 since 1929, has been paid out in taxes over the seven-year period. Taxes per ton of finished steel produced have amounted to \$3.38 over the period.

The states and municipalities in which the properties of the companies are located were by far the largest beneficiaries of the tax payments, receiving 81c. out of each dollar of taxes paid. Over the seven-year period, tax payments to state and local governments amounted to \$371,158,376, while Federal taxes aggregated \$84,559,963.

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# Cuts 10" x 10" Bloom *on the Corner* *without distortion*



This big fellow is also a precision machine, designed and built to shear blooms up to 10" x 10" *on the corner without distortion*. Due to the inherent design of these Up and Down Cut Shears, expensive tilting tables are not required. These shears have the added advantage of being able to cut material while it is either stationary or in motion.

Up and Down Cut Shears are another important contribution by Morgan Construction Company to modern rolling mill practice.

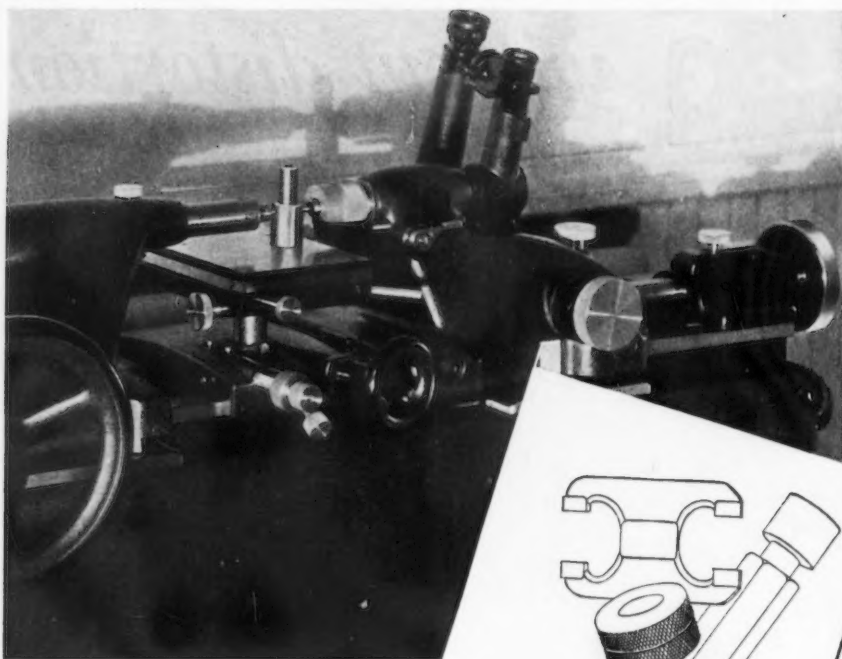
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The inspection of inspection tools must be a thorough-going third degree. And in order to give Taft-Peirce Gages their unquestionable authority, expense has been carried to seeming extravagance—in a controlled-temperature inspection room that is one of only a dozen-odd in the country.

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—nor is the exceptional care with which Taft-Peirce selects raw materials, fabricates, heat-treats and finishes them. For after the final check-up it is *doubly* certain that Taft-Peirce Gages are *right*—that they will measure accurately the maximum amount of work per dollar of their cost.

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### Builders Urged to Work with Scientists

Stressing the importance of architects consulting and working with scientists and research organizations in order to make the best possible use of the best building materials, Dr. Edward R. Weidlein, addressing the fifteenth annual meeting of the New York

Building Congress stated that he thought this would stimulate building activity more than any other one thing.

Dr. Weidlein, who is a director of the Mellon Institute for Industrial Research, Pittsburgh, and president-elect of the American Chemical Society, told of his experience gained from housing research during the past five years at the Mellon Institute. The use of metals has been an important

factor in building progress according to Dr. Weidlein, as he pointed out that the development of metal windows has been more rapid in the past three or four years than in the rest of this century combined. Copper and aluminum are also coming into prominence as potential roofing materials, he added.

In discussing steel houses, Dr. Weidlein mentioned the exhibition home of National Houses, Inc., now on display in Pittsburgh, which he calls one of the first houses he has ever known to be sold complete in every detail as is an automobile. This house, which was designed by William Van Alen, New York architect, is an all-steel product and illustrates the broad possibilities of development which the project holds for the steel industry.

A composition substance which is available in several varieties of wood finishes, including panelling and beams, and different types of stone and brick, was mentioned by Dr. Weidlein, as providing an artistic treatment which could be used over steel walls and other similar materials. This enables a builder to take advantage of the strength of a material without sacrificing beauty or fire-proofing.

### Steel Engineers Plan Detroit Exposition

APPROXIMATELY 35 technical papers, covering every phase of steel mill operations, will be presented by leading authorities at the thirty-second convention and iron and steel exposition of the Association of Iron and Steel Engineers to be held in Detroit, Sept. 22 to 25.

Among the features of this convention will be inspection trips to the Ford Motor Co. and the Great Lakes Steel Corp. The Great Lakes corporation has just put into operation its new 96-in. hot strip mill, while the Ford Company recently completed and put into service a 54-in. hot strip mill. These new units will be of considerable interest to the executive and operating officials of the steel industry who will be attending the convention.

At the present time the iron and steel exposition which is held concurrently with the annual meeting promises to be one of the largest ever sponsored by the society. Already 98 per cent of the space has been reserved by 125 manufacturers of steel mill equipment which indicates that it will no doubt be necessary to arrange for additional space to take care of the unusual demand.



## New Metal Finish For Industrial Uses

THE Asphalt Products Co., Grand Central Terminal, New York, is introducing a new type of finish for metal surfaces, that seems to have unusual characteristics. Of a modified asphalt base, these Aspro metal finishes have qualities that are generally not expected in finishes of that type. The manufacturer recommends them particularly for industrial machinery and equipment, utility, marine and railroad use.

The new products are insoluble in oil or the lighter distillates of petroleum. They exhibit extraordinary resistance to attack by the usual reagents encountered in industry, such as caustic and other alkaline solutions, cutting compounds, most of the acids in commercial use, water, sunlight, abrasion, alcohol. They will withstand heat up to 400 deg. F. without damage and are non-fire-supporting.

Aspro finishes may be applied by air gun or brush and may be air-dried or baked. The surface has a glossy luster and is harder than is usually the case with asphalt base finishes. The film has sufficient resiliency to prevent checking, cracking or peeling, and a degree of elasticity that permits expansion and contraction with changes in temperature. The manufacturer claims unusual hiding power for these finishes and excellent adhesion to metal surfaces.

Several colors are obtainable besides the usual black, including gray, red, brown and green.

## Wisconsin Metal Treating Firms Merge

WESLEY STEEL TREATING CO., 1333 West Pierce Street, Milwaukee, has purchased the West Allis Steel Treating Co., West Allis, Wis., and is merging its plant and business with the Wesley Metal Treating Co., organized recently to establish a heat treating shop at Racine, Wis., which will begin operations about May 18.

J. P. Smith has been appointed vice-president and general manager of the Racine branch, and John Dolhun, who was president of the West Allis concern, will be superintendent in Racine. The new plant will be operated on a 24-hr. basis with 15 employees, six of whom have been on the West Allis payroll.

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Cutting-off in a lathe has always been a slow and costly operation, hard on tools and wasteful of stock. With today's automatic, high-speed MARVEL Saws it has become an easy, fast operation, especially when cutting quantities of identical pieces from bar stock.

Requiring no more attention than an automatic screw machine (*Saving labor*), the new MARVEL Nos. 6A and 9A Production Saws will feed to length and cut-off diameters up to 10 inches at the rate of 10 pieces of 6" round or 160 pieces of 1½" round every hour floor to floor (*Saving time*). With unbreakable High-Speed-Edge Hack Saw Blades that are but a fraction of the width of a cutting-off blade, chip loss between pieces is materially reduced and the number of pieces per bar increased (*Saving stock*). Built by MARVEL, the pioneer builders of automatic bar push-up sawing machines, and strictly heavy-duty with full ball bearing construction, these saws have completely solved the "cutting-off problem."



Write for Bulletin 600

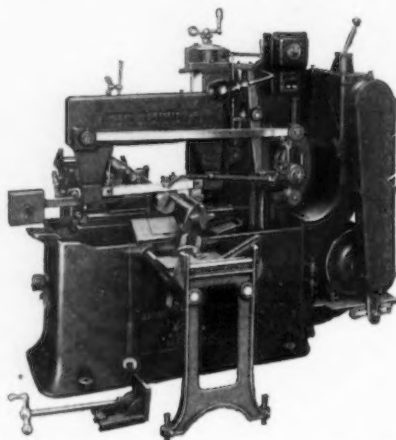
Armstrong-Blum Mfg. Co.

"The Hack Saw People"

349 N. Francisco Ave., Chicago, U.S.A.

## MARVEL

Automatic-Production  
High Speed Saws



No. 6 - A (capacity 6" x 6")

No. 9-A (capacity 10" x 10")

Nos. 6 and 9 identical with-out automatic bar push-up.

## Steel Research Cost of Over \$9,000,000 Is Highest on Record

**E**XPENDITURES for research work in the steel industry in 1936 will reach the highest total of any recent year and will exceed 1929 by almost 6 per cent,

according to the American Iron and Steel Institute.

An inquiry by the institute covering 42 companies comprising nearly 90 per cent of the steel ca-

capacity of the industry shows a combined research budget for the current year of \$9,200,000. The total for the same group of companies was \$8,100,000 in 1935 and \$8,700,000 in 1929.

Research will be directed principally towards improving the quality of the industry's products, finding new markets and new uses for steel, developing new types of products, and reducing costs.

During 1935 it is estimated that the cost of research amounted to about 37c. on every ton of finished products produced by the companies covered in the inquiry.

The facilities and equipment necessary for the steel industry's research program are valued in excess of \$6,000,000 and almost 2,200 engineers, metallurgists, chemists, physicists and other technical experts devote their full time to research. In addition, nearly 300 other employees of these steel companies spend a major part of their time in research endeavor.

Approximately 40 per cent of the \$9,200,000 which the steel industry is spending on research this year will go to discovering means of improving the quality of the various products of the industry.

Investigations along the line of developing new products will require about 20 per cent of the industry's research budget, while another 12 per cent will be spent in finding out where and how such new products can be used to best advantage.

The industry will spend this year about 18 per cent of its research budget in efforts to reduce steel manufacturing costs and thus pave the way for lower prices to steel consumers.

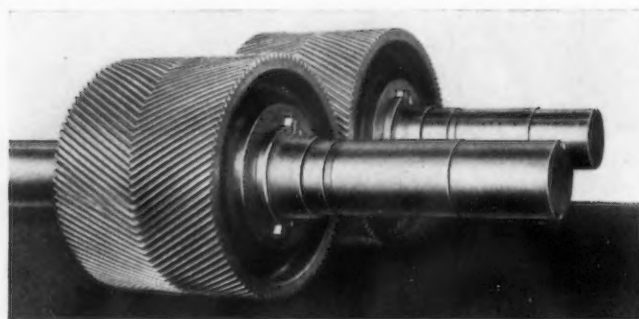
About 10 per cent of the industry's research activities will be devoted to a study of possible new markets and new uses for its established products.

Claude B. Schneible Co., Chicago, has appointed the following sales representatives: Parry Engineering Co., 154 Nassau Street, New York; Ferdinand G. Schultz, 215 Questend Avenue, Pittsburgh; Grant & Co., 2144 East Seventh Street, Los Angeles; Pacific Graphite Works, Fortieth and Linden Streets, Oakland, Cal.; Carl F. Miller & Co., 228 West Pacific Avenue, Spokane, Wash.

Reed-Prentice Corp., Worcester, Mass., has made arrangements with DeVlieg Milling Machine Co., Curtis Building, Detroit, to manufacture DeVlieg Milling Machines.

Egyptian Lacquer Mfg. Co. has moved offices to 1270 Sixth Avenue, Rockefeller Center, New York.

## PRECISION



The Sykes process of generation of gear teeth provides the nearest practical approach to theoretical accuracy. Combining this basic advantage with every modern facility made possible by recent technical progress results in gears of the highest degree of precision.

Farrel-Sykes precision generated gears insure smooth, quiet operation and dependable, economical performance under every condition of service.

Our engineers are at your service in connection with your gear problems.

**FARREL-BIRMINGHAM COMPANY, INC.**

333 Vulcan St., Buffalo, N. Y.



Waiting in line to register at the A.F.A. convention at Detroit. Total registration exceeded 5200, making this year's exposition one of the most successful in the association's history. Technical sessions were enhanced by many papers of particular interest to the practical founder.

## Detroit Is Host to 5000 Foundrymen

INTEREST in technical and trade associations usually is to some extent proportional to the industrial prosperity of members. It would seem, therefore, that American foundrymen are finally beginning to experience recovery inasmuch as last week's convention and exposition at Detroit was undoubtedly one of the most successful in the association's history. About 5200 American Foundrymen's Association members and guests registered at the show and technical sessions, and nearly 240 exhibitors crowded into Convention Hall to display their wares.

The technical sessions were replete with papers of immediate practical interest to foundrymen. Over 22 Detroit companies threw their doors open for visiting groups, and, as in past years, complete shop courses were presented which dealt with sand control and cast iron founding.

IN his annual address to A.F.A. members, D. M. Avey, retiring president, pointed out that the foundry industry has specific problems of its own to solve before it should enter the arena of political dissension. "We condemn boondoggling," said Mr. Avey, "yet foundries have gone along for years without planned activity for the advancement of their business interests; without any visible concerted program for creating new business; just living on orders from week to week."

"Furthermore," according to President Avey, "would the foundry business regard it as a part of its immediate problem to try to find solutions for any of the tremendous problems which confront all American industry?"

"While the A.F.A. is a technical organization, may we not profitably devote time to political and social problems which have not yet received constructive study, as far as we know, from any organized group of American business men? Should we condemn doggling by senators, representatives and bureaucrats while our own industry doggles?"

### New Officers Named

Following Mr. Avey's welcoming speech, new officers of the A.F.A. were announced. James L. Wick, Jr., president and general manager, Falcon Bronze Co., Youngstown, will be president for the ensuing year. This honor came to Mr. Wick after a long career of distinguished service to the foundry in-

dustry and in the affairs of the A.F.A. Born at Youngstown in 1883, Mr. Wick's career has been centered in that city. He attended Rayen High School and was graduated from the Massachusetts Institute of Technology with the degree of B.S. in Mechanical Engineering. Following graduation, he served as assistant to the general master mechanic, Youngstown Sheet & Tube Co., Youngstown, in 1906 and 1907, and as assistant to the chief engineer in 1907 and 1908. He resigned the latter position to serve as general manager, secretary-treasurer, Crystal Ice & Storage Co., Youngstown, with which he was associated until 1918. In that year, he returned to the Youngstown Sheet & Tube Co., and the following year became secretary and assistant general manager, Falcon Bronze Co. He became vice-president and general manager in 1925 and was elected to his present position in 1929.

Hyman Bornstein, director of the testing and research laboratories, Deere & Co., Moline, Ill., will serve as vice-president. Mr. Bornstein has had a distinguished career in the metallurgy field and is recognized both nationally and internationally as a leading authority on cast iron. Born in Chicago in 1891, he attended Armour Institute of Technology from which



he was graduated with the degree of B.S. in Chemical Engineering in 1911. He also was graduated from John Marshall Law School, Chicago, in 1915 with a LL.B. degree. After serving as chemist for the Union Pacific railroad and later for Swift & Co., Chicago, he acted as chemist for the City of Chicago. He resigned that position to become a captain in the Ordnance Department at the outbreak of the World War. Following the war, he became associated with Deere & Co.

D. M. Avey, editor of *The Foundry*, who has just completed two successful terms as president, will become a director. This is the second time he has served in this capacity. Other new directors are Carl C. Gibbs, president, National Malleable & Steel Castings Co., Cleveland; Marshall Post, vice-president, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.; James R. Allen, International Harvester Co., Chicago, and Lester N. Shannon, vice-president, Stockham Pipe Fittings Co., Birmingham.

Many of the technical papers presented at the meeting were of outstanding importance, and a number are briefly reviewed here. The complete manuscripts can be secured by addressing the American Foundrymen's Association, Chicago.

### Heat Treatment of Cast Iron

One of the outstanding technical sessions was that devoted to the hardening and tempering of cast iron. Two exchange papers, one from France and one from England, were concerned with this subject.

The paper by J. E. Hurst, president of the Institute of British Foundrymen reviewed known practices and recent experiments for proper heat treatment by hardening and tempering. It was pointed out that even though the hardening of cast iron was known as early as 1839, the effect of tempering in improving the properties is a modern development and is due to extensive research and investigation.

Data were presented to show that when cast iron is subjected to hardening treatment by heating to temperatures above the  $A_1$  critical point, and quenched in a suitable medium, either water or oil, an increase in hardness accompanied by a marked drop in ultimate breaking strength, either in tension, compression, shear or transverse loading, results. The magnitude of the increase in hardness varies with the chemical composition and the



JAMES L. WICK, JR.,  
elected president of  
the American Foundry-  
men's Association for  
the coming year.

structural condition of the particular cast iron treated. However, the increment in hardness may be over 100 per cent greater than the original "as cast" condition. In like manner, the magnitude of the decrease in ultimate breaking strength varies according to particular conditions, but it can be of a very serious order inasmuch as reductions of over 50 per cent in the ultimate strength value under conditions of transverse bending have been observed in quenched specimens.

Mr. Hurst pointed out that tempering of quench-hardened specimens is accompanied by a recovery in the ultimate breaking strength value, and all the investigations show that this recovery increases uniformly with increasing temperature until a maximum is reached followed by a decline with still further increment in tempering temperature. This phenomenon is accompanied by a decrease in Brinell hardness.

The Hurst paper listed considerable data on the influence of hardening and tempering on the hardness and ultimate breaking strength of chromium alloy cast irons containing varying amounts of phosphorus. The effect of combined carbon was presented, as well as the effect of the carbon plus silicon contents.

The paper was devoted mostly to the possibility of hardening and tempering plain unalloyed cast irons, and it was found that the best results, as measured by increase in hardness and improvement in strength properties, are obtained with phosphorus contents

below 0.6 per cent. Some attention, however, was devoted to the influence of alloy additions on the results obtained during quenching and tempering. The outstanding alloying elements were found to be nickel, manganese, chromium and molybdenum. An important aspect of alloy additions to cast iron for hardening and tempering is their effect on the magnitude of the improvement possible in strength properties after suitable treatment. This improvement in strength persists not only at the point of maximum strength in the hardened and tempered condition, but even after tempering to a hardness value equal to the original "as cast" condition. Improvements in strength values of about 50 per cent have been recorded.

The French exchange paper, prepared by Marcel Ballay and Raymond Chavy, of Paris, concerned itself mostly with specific applications of heat-treated cast irons in France. These applications were divided into four classes: (a) Irons machineable "as cast," then hardened, (b) martensitic irons, either employed "as cast" or given a draw, (c) martensitic irons, drawn then hardened by quenching and (d) austenitic irons, drawn then hardened.

The authors described many French commercial applications in these groups, i. e., automobile cylinder sleeves, gears, calibrating plates, support for grinding roller bearings, hydraulic pump pistons and air-cooled aviation cylinders. For instance, it was pointed out that the best iron for automobile cylinder sleeves is martensitic in structure and is treated after machining. This iron has excellent wear resistance, and analyzes 2.8 to 3.0 total carbon, 1.5 to 1.8 silicon, 0.8 to 1.0 manganese, 0.30 phosphorus, 2.5 to 2.8 nickel and 0.5 to 0.7 chromium.

Iron of this type is usually produced in a cupola, and the nickel and chromium additions are made in part to the charge in the form of risers, etc., and, in part, to the ladle in the form of nickel-silicon shot. An iron of this composition is machineable "as cast," the Brinell figure being around 270 to 300. The castings are quenched in oil at 1526 to 1562 deg. Fahr., then drawn at 482 to 572 deg. Fahr. so as to relieve internal stress and brittleness. After complete treatment, the hardness is around 450 Brinell and the metal is practically un-machineable. Finishing is accomplished by grinding. Allowance must be made for a very slight increase in diameter, i. e., about 0.004 in. for a sleeve of 4-in. diameter.

Other irons, their treatment and

physical characteristics were described in similar detail for many other commercial applications.

### **Applications of Alloy Cast Iron**

While the French exchange paper covered various uses of irons in that country, the same subject was considered in even greater detail for applications in the United States by a committee of the A.F.A. In a special publication (No. 36-12) a great mass of condensed data on the properties, foundry practice and applications of alloy cast iron was presented. The examples given are typical of present-day practice. About 256 specific iron analyses are included, and these types are grouped in the eight broad classifications which follow: (1) Automobile castings, (2) chemical equipment, (3) compressors and pumps, (4) crushing and grinding equipment, (5) machine tools, (6) metal working dies, (7) oil refinery equipment, and (8) miscellaneous.

A large number of users and producers of alloy iron castings in the United States submitted the figures on which the data given in this report are based. Even though this list is still considered incomplete, the data therein should undoubtedly be of considerable immediate value to many foundrymen.

Another valuable committee report of the A.F.A. was devoted to the heat treatment of alloy cast iron. This report is a correlation of data from many sources and is divided into the following sections: (1) Stress relief, (2) annealing (short anneal or malleablizing and inverse anneal), (3) quenching and tempering, (4) hardening, (5) air hardening, and (6) hardening by nitrogeneration.

Specific irons are considered in each case. Their reactions to the various heat treatments are tabulated, and, also, physical data and finishing characteristics are included.

Still another committee report dealt with various foundry practices for the production of alloy cast iron. The report pointed out that the modern foundry must be able to take advantage of the latest production information in order to remain in a competitive position and give its customers the best castings at lowest possible prices.

Although the report on foundry practices is subject to certain revisions, the information already assembled can be applied immediately to the advantage of many foundrymen having specific production problems. The data are divided into the following classifications:



**D. M. AVEY**, retiring president of the American Foundrymen's Association.

(1) Shrinkage, (2) machine finish allowance, (3) sectional considerations, (4) warpage, (5) molding sand, (6) mold dusting, washing and spraying, (7) core sand, (8) molding methods and mold treatments, (9) melting units and methods, (10) methods of adding alloys, (11) pouring temperatures, (12) cleaning and finishing and (13) shop testing.

### **Aluminum Bronze**

A manuscript prepared by J. E. Crown, of the United States Naval Gun Factory, dealt with aluminum bronzes, one of the most difficult of the non-ferrous alloys to produce with reasonable losses. The author reviewed the composition of the bronzes, melting practice, molding methods, pointed out the close control necessary and stressed the proper heating, gating and chilling of castings. He particularly pointed out that castings of intricate design should only be specified after consultation between designer and foundryman.

Although the founding of aluminum bronze is in general the same as other non-ferrous alloys, it is the most sensitive of the bronzes, a fact which causes many failures and stresses the importance of the need of vigilance in the attention to details. The majority of production is confined to copper-aluminum compositions containing from 5 to 11 per cent aluminum or copper-aluminum-iron containing 5 to 10 per cent aluminum and 1 to 5 per cent iron. The United States Navy uses 88 per cent copper, 9 per cent aluminum, 3 per cent iron and melts in a natural draft crucible furnace. The high strength of this alloy, combined with moderate

yet safe ductility, its low coefficient of friction when used in conjunction with steel, and its stability when in contact with many corroding agents are the principal reasons for its selection. This alloy is frequently used for submarine gun mounts, aircraft construction, and for worm wheels, propellers and similar highly stressed parts.

Mr. Crown first considered the proper melting practice for aluminum bronze alloys. When using all new metal, the copper is melted down under a good layer of charcoal and then deoxidized by small successive quantities of carbon-free manganese until small test buttons show a good shrinkage and then about one-half of the aluminum is added, which further acts as a deoxidizer and prepares the copper for the iron. The iron is then added in the form of thin sand-blasted strips of sheet steel and after thorough stirring, the remaining aluminum is added. To the complete melt, 0.5 per cent magnesium and manganese sulphate is added as a flux.

When scrap is used in conjunction with new metal, the scrap is melted first, to which is added the aluminum; then the iron and finally the copper which has been preheated and fluxed in proportion to new metal charge.

Scrap should be confined to aluminum bronze scrap of previous melts as scrap copper or scrap aluminum, unless their composition is definitely known, should not be used due to possible impurities.

Mr. Crown also pointed out that although melting should be at a low temperature, the melt should be completed as rapidly as practical to prevent undue exposure to furnace gases. Crucibles used for melting aluminum bronze should not be used for melting other alloys.

Aluminum bronze is not hard on a mold, and regular brass founding practice is followed except that again the importance of attention to apparent minor details must be stressed. Large castings are made in dry sand, using a coarse sand suitable for heavy brass. Medium and light castings are made in green sand where a good grade of Albany sand is satisfactory. Skin drying reduces risk of failure in green sand molding.

Where a binder is used, either in the molding sand or in the core, this should be checked closely to determine if it causes any "fluttering" of the metal against the face of the sand, for such agitation will cause porosity under the skin that will develop upon machining.

Aluminum bronze is a high



shrinkage alloy and liberal use of heads is necessary. The copper-aluminum series requires heads about equal to manganese bronze, the copper-aluminum-iron series even greater. On heavy gears, circumferential heads often have proved very satisfactory in not only taking care of the shrinkage but also to furnish an outlet for the scurf created in pouring.

Whereas Mr. Crown's paper dealt with physical characteristics and general foundry technique, the founding of aluminum bronze was considered in even greater detail by M. T. Ganzauge, of Goulds Pumps, Inc. Castings which must withstand high pressure received the greatest consideration.

Mr. Ganzauge reviewed his company's practice of balancing scrap against ingots, use of charcoal, proper pouring temperatures, pouring technique, etc. One interesting feature employed by his company is the use of carbon monoxide in the molds to reduce the amount of seams and folds formed. A long rubber hose is connected with a tank of carbon dioxide gas and, before a large casting is poured, this gas is blown gently into the mold cavities. Carbon dioxide gas, being heavier than air, displaces the air in the mold cavities. As the gas is invisible, burning matches stuck in the risers and sprue holes indicate whether or not the mold is filled with gas. If the mold is full, the flame is extinguished instantly.

This operation is done while the pots are being removed from the furnaces. No time is lost in pouring. The casting is poured immediately after the mold has been gassed. Since there is no free oxygen present, no oxide is formed, therefore, no seams or folds are formed in the mold cavity itself. The improvement in the quality of the castings was found to be sufficiently high to justify the continuation of this gas treatment, which is used only in the larger molds.

Other points brought forth by the author were as follows:

(1) The metal should be poured in a slow, steady stream at the lowest pouring temperature at which a complete casting of any one design may be obtained with regularity.

(2) The molding sand should be on the "dry-side" and be of a high permeability. The sand must be rammed up uniformly around the pattern and any damp spots, caused for instance by excessive swabbing or patched-up corners and lugs, must be avoided. If the metal simmers and fails to lie

quietly at any point it will foam and produce dross.

(3) The core sand should be very open, well vented and low in oil bond.

(4) All cast iron chills used in the cores as well as in the mold must be free from rust and scale, absolutely dry, and in the latter case sufficiently preheated.

(5) The gate should be so arranged that the metal enters the mold at the lowest possible point or points and in a manner that will avoid the formation of ripples and spurting.

(6) Heavy sections must be fed by proportionately large risers to eliminate shrinkage or chills must be used. In some designs a combination of both is effective.

### **Sand Research**

A number of papers dealt with the testing and control of molding sand. H. A. Deane, of Deere & Co., indicated that no more than three grades of sand should be required in a foundry. For castings weighing up to 1000 lb. and made on sand slingers, synthetic sand composed of Ottawa silica sand and a clay or Bentonite bond is generally used because it is easier to prepare a synthetic sand than to secure an acceptable natural one. For castings weighing from 100 to 300 lb. and made on heavy jolt strip machines, either a synthetic bonded silica sand or an open natural sand is used. Natural sand is used for castings ranging in weight from 1 to 100 lb. It is not advisable to use a completely synthetic bonded sand for this class of work because there is too much flowability. Sometimes for very small castings the permeability is reduced to below what is generally considered standard by using sand with a finer grain size. The present tendency is toward using sand with lower moisture and harder ramming, which gives smoother and more nearly true castings.

The physical properties of a synthetic sand fluctuate more rapidly than those of natural sands. Moisture content in synthetic sand is much less stable and it is necessary to maintain constant vigilance for good work. Usually synthetic sand additions to the heap are made of two parts of silica sand, one part of clay bond and one part of sea coal. These additions should be spread evenly on the heaps daily and in proportion to the requirements as shown by the daily sand tests. Control of moisture content is possibly the most important single property, and is the one most often neglected. Keeping the moisture of the sand at the lowest limit of workability is very

desirable because cleaner and fewer defective castings will be obtained.

An informative paper on the physical properties of molding sand was presented by H. W. Dietert and R. A. Dietert, of Detroit. Charts were presented to show that the deformation of a sand increases rapidly as moisture content increases. This explains the brittleness of dry tempered sand. It also explains the tendency toward increase in drops and crushes when the sand is low in moisture. Deformation of molding sand is little affected by the size of the sand grains. Deformation increases as clay content increases or decreases from a set point, 15 per cent in the example cited. The greatest increase in deformation occurs as the clay content increases beyond 15 per cent, undoubtedly due to the fact that the clay is acting as a filler and the sand acquires a clay-like property.

Mold hardness materially affects all properties of the sand, such as permeability, green and dry strength, expansion and deformation. Deformation increases slowly as the mold hardness increases up to a certain point, beyond which the deformation increases quickly, owing to the unusually rapid increase of green compression strength as the sand is rammed to an extremely high mold hardness. Both the deformation and the strength of the sand increase as sea coal is added up to 6 per cent. Further increases reduce the deformation. When it is used to calculate the modulus of compression at yield load, deformation becomes a practical problem, since it gives information as to the load-carrying ability of the sand in conjunction with resistance to swelling of the mold. Modulus of compression may be increased by decreasing the moisture content, decreasing coarse material, increasing clay content and increasing mold hardness. Resilience of a molding sand may be increased by increasing all five factors of moisture content, percentage of fine material, clay content, mold hardness and percentage of sea coal.

While most sands are tested at room temperature, the really important information required is their performance at high temperature, according to P. E. Kyle, of the Massachusetts Institute of Technology. Under casting conditions the grains of silica expand and at the same time the clay undergoes changes. This action is most severe at the mold surface which receives the most heat. In fact, the rate of heat transfer back into the mold is not appreciable. In the pouring of iron, for example, it takes over 15 minutes be-



fore the free water is driven out of the sand at a distance only slightly over 1 in. from the casting. Tests have been devised to measure the expansion and contraction of molding sand under conditions of high temperature. The effect on the silica grains seems to be less important than the changes that take place in the bonding clay. First the free water is driven off and then, at a temperature around 900 deg. F., about 50 per cent of the combined water in the form of hydrates is lost and by further heating at 1100 deg. F. all the water is removed, leaving the clay in such a condition that it cannot be restored as a binder.

Tests have also been made of compressive strength at high temperatures. In general, it is not possible to divorce expansion and compressive strength properties in the development of molding mixtures. In some cases it has been noted that sands having the greatest expansion also have the highest strength at high temperatures. High strength, however, is not always desirable. Tests of permeability indicate that permeability is less at high temperatures and is less for sands containing greater amounts of gas-forming materials. The indicated permeability is lower, not because the rate of flow of gas is reduced, but because there is more gas to get rid of due to the formation and expansion of gases from the metal and mold material.

### Controlling Pouring Temperatures

One of the most important phases of foundry practice is temperature control of the metal. Carl F. Joseph, metallurgist, Saginaw Malleable Iron Division, General Motors Corp., gave some very definite pointers as to what his company was doing along these lines. The first step in developing temperature control is choosing the proper equipment for measuring such temperatures. Most optical pyrometers are not kept in good condition. They may have dirty lenses, gradually deteriorating filaments, changing millimeter characteristics, run-down dry cells and the like, or the operator may not pick out the proper part of the stream in taking the readings. All these possible variations cause a difference in calibration and instill a lack of confidence in the operator. At the Saginaw plant, three optical pyrometers are available for service use and one standard millimeter is maintained in the laboratory with two standard lamps. Once a year or oftener the standard equipment is checked

against a standard platinum-rhodium thermocouple.

Reading the temperature is one thing, maintaining it is another. In this plant all the iron is melted in a cupola, desulphurized in a forehearth and superheated in an electric furnace. Transfer from the forehearth to the electric furnace is done by a 3-ton insulated ladle. In order to cut down the radiation losses and to reduce the amount of superheating necessary in the electric furnace, special insulated teapot type pouring ladles have been constructed. They are almost completely covered and are lined with 2½ in. of refractory, backed up with 1¼ in. of insulation. Although the relining cost of the new ladle is three times that of the old one, it has a life of 42 pouring days as compared with the four-day life of the old type. Furthermore, because of the conservation of heat in the ladle, only 190 deg. F. of superheat is now required, as compared with 370 deg. necessary before. Some of the results obtained from using insulated ladles have been as follows: a substantial reduction in energy consumption required for superheating and in electrode consumption; increase in capacity of the electric furnace since the melting time is reduced; reduction in the amount of foundry spillage; increase in temperature of the last iron out of the pouring ladle by 75 deg. F.; reduction in over-all ladle maintenance; and improved working conditions.

In studying pouring temperatures, it has been found that more satisfactory results are obtained by limiting the amount of superheat. For example, power consumption is approximately 25 per cent higher to make iron at 2900 deg. F. than at 2830 deg. F. Refractory and furnace maintenance costs are also considerably higher. The pouring temperature has a marked effect on the amount of clay for rebond necessary to maintain the proper bond strength. Also increasing pouring temperature increases the sand losses from the molding system due to the fact that more sand adheres to the castings. Present practice in this foundry is to hold the temperature of the iron in the furnace spout to 2830 deg. F., which drops to 2690 in the pouring ladles and the minimum temperature of the last iron from the ladle is 2625 deg. F. or over.

Fluidity of the metal is determined by a number of factors aside from temperature, including the carbon content of the metal (the higher, the more fluid), the silicon and phosphorus content, the

nature of the raw material in the charge, desulphurization with soda ash and the furnace atmosphere. The exclusion of air in the electric furnace causes a more reducing atmosphere which results in lack of fluidity. Periodic checks have been made to determine whether it is possible to pour at lower temperatures and still maintain proper fluidity. During the past year it has been possible to lower the temperature 20 deg. F. from the point at which there is a marked drop-off in fluidity. This means that less heat need be used in the electric furnace without danger of mis-runs.

### New Line of D. C. Motors Announced

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, has brought out a new line of fan-cooled, totally enclosed d.c. motors, designed for general industrial service, and particularly for use in automobile factories, foundries, cement plants, coal tipplers, tuck products plants, machine shops and steel mills, where abrasive and metallic dust is present. Sizes of the new motors range from 5 to 75 hp. for 115, 230 and 550 volts d.c.

The new motors, known as type SK, are built so that all foreign matter is excluded from the interior of the motor. When dust lodges in the windings of a motor it is almost certain to wear away the insulation and cause grounds and short circuits. The interior of this type of motor is also protected against the entrance of splashing water such as occurs during the hosing of floors or walls.

Until the development of this design of motor, the commutator and brushes were not readily accessible due to the presence of the external fan and shroud on the commutator end. It was necessary to open or remove the outer shroud and then remove the bracket cover when making adjustments. With the new design, only one cover need be removed and then it is no more trouble to examine the brushes or commutator than on a standard enclosed motor. This design has a distinct advantage that permits mounting the pulley or pinion close to the supporting bearing. Also, the motor may be mounted close to a wall or gear box at the pulley end without interfering with the free flow of ventilating air. The flexibility in this construction also permits adaption, with some modifications for waterproof and explosion tested applications.

# April Production of Steel Ingots Up Sharply Over Previous Years

**P**RODUCTION of Bessemer and open-hearth steel ingots in April, as reported by the American Iron and Steel Institute, totaled 3,942,254 tons, an increase of 599,635 over March when 3,342,619 tons was produced and a gain of 1,301,652 tons over April, 1935, when output amounted to 2,640,602 tons. April output was the highest since May, 1930.

Daily output in April was 151,625 tons, against 128,562 tons in the previous month and 101,562 tons in same period a year ago. Operations averaged 69.09 per cent of capacity, compared with 58.58 per cent for March and 45.88 per cent for April, 1935.

REPORTED BY COMPANIES WHICH IN 1934 MADE 97.91 PER CENT OF THE OPEN-HEARTH AND 100 PER CENT OF THE BESSEMER INGOT PRODUCTION

1934	Reported Production (Gross Tons)		Calculated Monthly Production All Companies		Number of Work- ing Days	Per Cent of Opera- tion
	Open-Hearth	Bessemer	Monthly	Daily		
January	1,786,458	172,489	1,997,129	73,968	27	33.59
February	1,993,465	175,873	2,211,944	92,164	24	41.86
March	2,540,243	203,904	2,798,440	103,646	27	47.07
April	2,622,531	257,482	2,936,064	117,443	25	53.34
May	3,003,676	331,620	3,399,494	125,907	27	57.18
June	2,718,782	282,592	3,059,483	117,672	26	53.44
July	1,340,924	119,869	1,489,453	59,578	25	27.06
August	1,245,139	109,598	1,381,350	51,161	27	23.24
September	1,127,269	117,615	1,268,977	50,759	25	23.05
October	1,325,777	127,789	1,481,902	54,885	27	24.93
November	1,447,626	132,059	1,610,625	61,947	26	28.13
December	1,794,437	131,467	1,964,257	78,570	25	35.68
Total	22,946,327	2,162,357	25,599,118	83,312	311	37.38
1935						
January	2,578,531*	239,858	2,870,161†	106,302†	27	48.02†
February	2,499,744*	224,336	2,774,271†	115,595†	24	52.22†
March	2,582,628*	230,810	2,865,292†	110,204†	26	49.78†
April	2,361,275*	231,916	2,640,602†	101,562†	26	45.88†
May	2,332,042*	254,796	2,633,661†	97,543†	27	44.06†
June	2,007,862*	210,487	2,258,664†	90,347†	25	40.81†
July	2,003,151*	224,456	2,267,827†	87,224†	26	30.40†
August	2,629,768*	233,361	2,915,930†	107,997†	27	48.78†
September	2,540,264*	233,737	2,825,004†	113,000†	25	51.04†
October	2,815,510*	270,719	3,142,759†	116,398†	27	52.58†
November	2,841,199*	252,163	3,150,409†	121,170†	26	54.73†
December	2,789,015*	228,392*	3,073,405†	122,936†	25	55.53†
Total	29,980,989*	2,835,031*	33,417,985†	107,453†	311	48.54†
1936						
January	2,793,421	196,389	3,045,946*	112,813*	27	51.40*
February	2,707,562	202,445	2,964,418*	118,577*	25	54.03*
March	3,095,375	185,040	3,342,619*	128,562*	26	58.58*
April	3,565,821	304,775	3,942,254	151,625	26	69.09

\*Revised.  
†Adjusted.

# Steel Corporation Ships Largest April Tonnage Since 1930

**F**INISHED steel products shipped by the United States Steel Corp. during April totaled 979,907 tons, and were the highest since June, 1934, when 985,337 tons was moved. Based

on shipments, the corporation's finished steel making facilities operated during the period at 63.2 per cent of capacity.

This compares with a rate of 50.5 per cent in the previous

month when shipments aggregated 783,552 tons, 36.7 per cent in April, 1935, when the volume was 591,728 tons. Not since April, 1930, however, when 1,188,456 tons was indicated, has the corporation experienced higher April deliveries corresponding period.



MONTHLY SHIPMENTS OF STEEL PRODUCTS BY UNITED STATES STEEL CORP.

Month	1933		1934		1935		1936	
	Ship- ments	Per Cent of Ca- pacity	Ship- ments	Per Cent of Ca- pacity	Ship- ments	Per Cent of Ca- pacity	Ship- ments	Per Cent of Ca- pacity
January	285,137	17.7	331,777	19.8	534,055	31.9	721,414	44.8
February	275,929	18.5	385,500	25.9	583,137	39.2	676,315	45.3
March	256,793	15.3	588,209	35.2	668,056	41.5	783,552	50.5
April	335,321	21.6	643,009	41.5	591,728	36.7	979,907	63.2
May	455,302	27.1	745,063	44.5	598,915	35.8	.....	.....
June	603,937	37.4	985,337	61.2	578,108	36.7	.....	.....
July	701,322	45.1	369,938	23.9	547,794	34.0	.....	.....
August	668,155	39.8	378,023	22.6	624,497	37.3	.....	.....
September	575,161	35.6	370,306	23.9	614,933	39.7	.....	.....
October	572,897	35.5	343,962	20.6	686,741	41.1	.....	.....
November	430,358	26.7	366,119	22.7	681,820	42.3	.....	.....
December	600,639	38.7	418,630	27.0	661,515	42.7	.....	.....
Plus or minus yearly adjustment	(44,283)	...	(19,907)	...	.....	...	.....	...
Total for year	5,805,235	30.1	5,905,966	30.6	7,371,299	38.3	.....	...

Square D Co., Detroit, reports net profit at \$122,232 for the first quarter, equal to 25c. a share on the class B common stock. This compares with a profit of \$132,135 for the similar period last year.

Cutler-Hammer, Inc., Milwaukee, reports for the quarter ended March 31, net income of \$232,343. This is equal to 70 cents a share on 329,999 no-par shares of capital stock outstanding Dec. 31, 1935.

Continental Steel Corp., Kokomo, Ind., had net income, after Federal taxes and charges, of \$54,343 in the quarter just ended.



# Manhattan Island Has 27,000,000 Tons of Steel In Present Use

**A**PPROXIMATELY 27,000,000 tons of steel are in service today in the buildings and transportation facilities of the Borough of Manhattan, New York, according to a recent estimate by the American Iron and Steel Institute.

Steel enables more than 1,650,000 people to live on an island only 22 sq. mi. in area, and steel has largely built the facilities for the transportation and employment of many millions more.

Without steel, Manhattan would be suitable for only the most primitive of living and working conditions, and if by means of a gigantic magnet every ton of steel were removed and never replaced, the island once sold for the equivalent of \$24 and now valued for tax purposes at over \$8,000,000,000 would lose by far the greatest part of its present worth.

Included in the 27,000,000 tons of steel essential to the development of Manhattan are the steel in the 18 bridges which connect it to the mainland and Long Island, the steel in its tunnels, subways, elevated and surface car lines, the steel in its railroad terminals and in its pipe lines, in automobiles, and in buildings and docks.

About 348,000 tons of steel are in use in the bridges over the three rivers surrounding Manhattan Island, while the construction of the Holland Tunnel and that part of the new Mid-town Tunnel which has been completed has required almost 200,000 tons.

Subway and elevated lines are built of 675,000 tons of steel which includes the steel in elevated structures and subway tubes, rails and rolling stock.

Surface car lines operating until recently on Manhattan accounted for about 95,000 tons of steel, a figure which, in addition to tracks, etc., includes the weight of the few steel poles which support the only over-head trolley wires on Manhattan.

Pipe lines for carrying the water, steam and gas consumed in Manhattan require 214,000 tons of steel and iron.

The railroads entering Manhattan Island use an estimated 1,200,000 tons of steel for tracks, terminal facilities and terminal rolling stock.

An estimated 1,360,000 tons of steel is in the passenger automo-

biles, trucks and busses on Manhattan, and 52,000 more tons were used in building the elevated West Side Highway.

The docks and buildings on Manhattan are built of 23,000,000 tons of steel, it is estimated. This esti-

mate includes weight of the structural steel, steel pipe, partitions, fixtures and ornamental trim used in the buildings, as well as their elevator equipment.

If the 27,000,000 tons of steel used on Manhattan were cast into a single cube, the cube would measure 498 feet along each edge. To move it would require the harnessing together of 3900 powerful freight locomotives, even if there were no friction between the steel cube and the earth.

## OBITUARY

**WILLIAM H. MCGREGOR**, chairman of the board of National Twist Drill & Tool Co., Detroit, died after several months' illness at his home in Detroit on May 1, aged 75 years. He was born in Detroit and received his early education in the Detroit public schools. At the age of 16, he obtained work as a messenger boy with Parke, Davis & Co., eventually becoming superintendent of one of the departments during the 19 years he remained with that firm. For a while, he devoted his interest to politics, being president of the Board of Education in 1898 and County Clerk for several years thereafter. In 1903, he helped form the National Twist Drill & Tool Co. and served as its president until 1926, when he assumed the title of chairman of the board.

♦ ♦ ♦

**A. C. JONES**, research engineer for the Lebanon Steel Foundry, Lebanon, Pa., died in that city on May 6, aged 45 years. He was a graduate of Crane College of Technology and after serving in the War became associated with the Lebanon company as research engineer and chief metallurgist in 1922. He was a member of a number of technical societies including the American Society for Metals, American Foundrymen's Association and American Society for Testing Materials.

♦ ♦ ♦

**BURTON L. DELACK**, general assistant to W. R. Burrows, vice-president in charge of manufacturing of the General Electric Co., and until two years ago manager of the company's Schenectady works, died on May 7. He became identified with the company in 1903 after his graduation from Clarkson College of Technology.

After having spent a number of years in the railway motor engineering department, he was made assistant manager of the Erie works, from which he was promoted in 1926 to assistant manager of the Schenectady works. The following year Mr. Delack was appointed acting manager and on Jan. 1, 1928, manager. He asked to be transferred to Mr. Burrows' staff in 1934 because of ill health.

♦ ♦ ♦

**HENRY ADAMS MORSS**, president and treasurer of the Simplex Wire & Cable Co., died at a Boston hospital on May 6. Mr. Morss was born in Boston in 1871, was graduated from the Massachusetts Institute of Technology in 1892, and immediately became associated with Morss & Whyte Co., manufacturer of wire goods, later taking charge of the Simplex company. He also was vice-president and director of the Hub Wire Cloth & Wire Co.

♦ ♦ ♦

**GEORGE H. FELTES**, president and treasurer of the Standard Electrical Tool Co., Cincinnati, died at French Lick Springs, Ind., on May 6, aged 56 years. He entered the machine tool industry at an early age and was at one time secretary and treasurer of the United States Electrical Tool Co. He bought controlling interest in the Standard Electrical Tool Co. in 1926 and had been head of the concern since that time.

**Allegheny Steel Co.**, Brackenridge, Pa., reported net earnings for the three months ended March 31, 1936, of \$336,964, after all charges and estimated Federal and State income taxes, equivalent to 45c. a share on 612,685 common shares outstanding. This compares with net earnings of \$324,145, or 43c. a share on 610,695 common shares, in the first quarter of 1935. Damage to company property caused by the floods in March is estimated at \$110,000, but none of this expense is included in the statement of earnings, pending decision of the board of directors as to its distribution.



# Steel Exports Higher—Imports Rise Sharply

Exports (In Gross Tons)	March		Three Months Ended March	
	1936	1935	1936	1935
Pig iron .....	260	137	497	682
Ferromanganese and speigeleisen.....	.....	29	8	32
Other ferroalloys .....	110	.....	530	.....
Iron and steel scrap.....	163,295	228,338	459,366	559,688
Tin plate scrap.....	2,544	2,980	6,318	10,083
Waste-waste tin plate.....	1,614	1,634	5,733	5,625
<b>Pig iron, ferroalloys and scrap.....</b>	<b>167,823</b>	<b>233,118</b>	<b>472,452</b>	<b>576,110</b>
Ingots, blooms, billets, sheet bars.....	969	7,993	1,378	16,544
Skelp .....	919	990	3,256	2,534
Wire rods .....	4,042	1,354	9,767	6,314
<b>Semi-finished steel .....</b>	<b>5,930</b>	<b>10,337</b>	<b>14,401</b>	<b>25,392</b>
Bars, concrete reinforcement.....	166	.....	473	.....
Bars, other steel.....	3,689	4,336	11,553	14,642
Iron bars .....	78	80	271	347
Plates, iron and steel.....	4,734	3,658	13,509	9,688
Sheets, galvanized steel.....	3,773	7,092	13,472	18,594
Sheets, galvanized iron.....	66	263	294	418
Sheets, black steel.....	14,538	6,706	32,660	25,825
Sheets, black iron.....	723	314	1,974	1,183
Hoops, bands, strip steel.....	4,604	4,689	13,925	10,973
Tin plate and taggers' tin.....	23,444	9,117	54,335	34,337
Terne plate (including long ternes)....	193	209	829	757
Structural shapes, plain material.....	3,840	3,100	11,068	6,973
Structural material, fabricated.....	2,474	1,647	4,321	5,484
Sheet piling .....	439	.....	853	.....
Tanks, steel .....	3,147	604	7,503	1,879
Steel rails .....	8,073	6,722	16,511	8,911
Rail fastenings, switches, spikes, etc....	911	808	2,475	2,217
Boiler tubes .....	531	790	1,335	1,942
Casing and oil line pipe.....	1,510	3,147	5,188	12,242
Pipe, black and galvanized, welded steel	881	4,633	5,514	11,963
Pipe, black and galvanized, welded iron	267	549	763	1,021
Plain wire .....	3,547	3,470	10,499	8,582
Barbed wire and woven wire fencing...	2,861	2,622	7,159	7,659
Wire cloth and screening.....	85	97	233	271
Wire rope .....	208	524	800	1,074
Wire nails .....	569	1,270	1,918	2,601
Other nails and tacks.....	242	335	719	989
Other wire and manufactures.....	409	590	1,262	1,261
Bolts, nuts, rivets and washers, except track .....	540	665	1,449	1,677
Other finished steel.....	134	106	453	303
<b>Rolled and finished steel.....</b>	<b>86,676</b>	<b>68,143</b>	<b>223,318</b>	<b>193,813</b>
Cast iron pipe and fittings.....	1,762	1,191	3,235	4,384
Malleable iron screwed fittings.....	252	304	660	757
Car wheels and axles.....	704	8,290	1,355	9,474
Iron castings .....	592	672	2,351	2,085
Steel castings .....	171	368	590	715
Forgings .....	427	594	1,341	1,564
<b>Castings and forgings.....</b>	<b>3,908</b>	<b>11,419</b>	<b>9,532</b>	<b>18,979</b>
<b>Total .....</b>	<b>264,337</b>	<b>323,017</b>	<b>719,703</b>	<b>814,294</b>

Imports (In Gross Tons)	March		Three Months Ended March	
	1936	1935	1936	1935
Pig iron .....	23,743	2,708	53,436	15,482
Sponge iron .....	51	51	822	308
Ferromanganese <sup>1</sup> .....	2,345	2,800	5,501	8,179
Speigeleisen .....	1,295	.....	4,760	.....
Ferrosilicon <sup>2</sup> .....	.....	1	1	1
Ferrosilicon <sup>3</sup> .....	85	60	222	272
Other ferroalloys <sup>4</sup> .....	6,992	2,352	22,268	7,557
Scrap .....	34,511	7,972	87,010	31,800
<b>Pig iron, ferroalloys and scrap.....</b>	<b>34,511</b>	<b>7,972</b>	<b>87,010</b>	<b>31,800</b>
Steel ingots, blooms, etc.....	42	56	42	622
Billets, whether solid or hollow.....	45	.....	168	.....
Wire rods .....	1,039	1,881	5,205	3,608
<b>Semi-finished steel .....</b>	<b>1,126</b>	<b>1,937</b>	<b>5,115</b>	<b>4,230</b>
Concrete reinforcement bars.....	86	92	324	201
Hollow steel bars.....	134	50	469	155
Merchant steel bars.....	3,844	1,469	9,424	5,283
Iron slabs .....	.....	.....	.....	.....
Iron bars .....	77	39	388	.....
Boiler and other plate.....	.....	7	52	36
Sheets, skelp and sawplate.....	1,658	422	5,414	1,289
Die blocks or blanks, etc.....	3	.....	8	.....
Tin plate .....	45	32	59	46
Structural shapes .....	4,477	1,719	12,268	7,173
Sheet piling .....	.....	.....	527	.....
Rails and track material.....	334	3	851	621
Welded pipe .....	688	143	1,373	296
Other pipe .....	2,126	293	5,005	3,209
Hoops and bands for baling.....	59	177	59	269
Other hoops and bands.....	1,706	1,349	4,883	4,790
Barbed wire .....	2,032	3,398	6,154	7,299
Round iron and steel wire.....	331	330	1,203	969
Telegraph and telephone wire.....	26	4	27	4
Flat wire and steel strips.....	218	152	684	367
Wire rope and strand.....	268	204	626	510
Other wire .....	143	70	416	283
Nails, tacks and staples.....	2,604	1,339	7,392	3,298
Bolts, nuts, rivets.....	15	28	103	86
Horse and mule shoes.....	46	96	88	220
<b>Rolled and finished steel.....</b>	<b>20,920</b>	<b>11,416</b>	<b>57,797</b>	<b>36,620</b>
Malleable iron pipe fittings.....	7	9	11	46
Cast iron pipe and fittings.....	32	.....	32	.....
<b>Castings and forgings.....</b>	<b>124</b>	<b>136</b>	<b>302</b>	<b>374</b>
<b>Total .....</b>	<b>56,720</b>	<b>21,470</b>	<b>150,567</b>	<b>73,070</b>

<sup>1</sup> Manganese Content. <sup>2</sup> Chrome Content. <sup>3</sup> Silicon Content. <sup>4</sup> Alloy Content. <sup>5</sup> New Class. No comparable figures for previous year.

EXPORTS of semi-finished and finished iron and steel products from the United States in March, amounting to 264,337 tons were 50,601 tons, or 24 per cent, greater than in February. Increases were noted chiefly in pig iron, ferroalloys and scrap; tin plate and tagger's tin; steel rails; steel tanks; rolled and finished steel; and semi-finished steel. Compared with March, 1935, however, exports were 22 per cent, or 58,680 tons, less.

Imports increased 30.8 per cent over February and were 164.2 per cent greater than the corresponding period last year. Great increases were noticed in pig iron, ferroalloys and scrap, which went up 333 per cent over March, 1935. Structural shapes, other pipe, sheets, skelp and sawplate, merchant steel bars, and nails, tacks and staples also accounted for large amounts of the rise.

March pig iron imports of 23,743 reflected an increase of 62 per cent over the 14,660 tons brought into this country in February. Canada, the Netherlands, Norway, Russia and Sweden were responsible for most of this increase.

A gain of 5 per cent in imports of iron and manganese ores, particularly from Norway and other countries, was also reported.

## March Imports of Iron and Manganese Ores

	(In Gross Tons)		Manganese Concentrates, 35 Per Cent or Over	
	Iron Ore			
	1936	1935	1936	1935
Canada .....	30	.....	.....	.....
Cuba .....	22,000	22,510	2,320	.....
Chile .....	86,125	64,800	.....	.....
Spain .....	50	412	.....	.....
Norway .....	19,444	.....	.....	.....
Sweden .....	.....	.....	.....	.....
French Africa .....	.....	.....	.....	.....
Russia .....	.....	7,090	4,378	10,256
India .....	.....	.....	8,845	.....
Brazil .....	.....	.....	1,251	.....
West Africa.....	.....	.....	6,637	2,248
Other Countries ..	4,166	72	9	375
<b>Total .....</b>	<b>131,815</b>	<b>94,884</b>	<b>23,440</b>	<b>12,879</b>

## March Imports of Pig Iron by Countries of Origin

	(In Gross Tons)		Three Months Ended March	
	March			
	1936	1935	1936	1935
United Kingdom .....	50	.....	1,082	109
British India.....	4,503	1,769	13,192	4,514
Germany .....	59	.....	2,535	.....
Netherlands .....	15,029	.....	27,521	6,759
Canada .....	777	584	1,135	2,405
France .....	.....	50	.....	50
Belgium .....	.....	50	529	510
Norway .....	660	165	1,007	240
Sweden .....	164	40	164	240
Russia .....	2,551	.....	6,271	.....
All others .....	.....	.....	.....	854
<b>Total .....</b>	<b>23,743</b>	<b>2,708</b>	<b>53,436</b>	<b>15,482</b>

## RAILROAD BUYING

Norfolk & Western is asking bids for construction of 1000 57½-ton all-steel coal cars.

Southern Pacific is inquiring for 1750 box cars, 750 automobile cars, 200 flat cars and 100 gondola cars.

New York, Chicago & St. Louis has divided an order for 777 cars among three bidders.

Canadian National has contracted with B. F. Sturtevant Co., Hyde Park, Mass., for air conditioning units for its 1936 car conditioning program.

Missouri Pacific has been authorized to purchase 1500 50-ton box cars at \$2,500 each and 500 55-ton coal cars at \$2,350 each, to be paid for by 10-year equipment trust certificates.

St. Joseph Railway, Light, Heat & Power Co., St. Joseph, Mo., has placed order with J. G. Brill Co. for nine 30-passenger trackless trolleys.

American Car & Foundry Motors Co. has received order from Penn-Ohio Coach Lines Co., Youngstown, Ohio, for six 36-passenger motor buses.

### RAILS AND TRUCK SUPPLIES

Kansas City Southern has placed 3000 tons of rails with Carnegie-Illinois Steel Corp., and 1000 tons with Inland Steel Co.

## Colorado Fuel & Iron Effects Reorganization

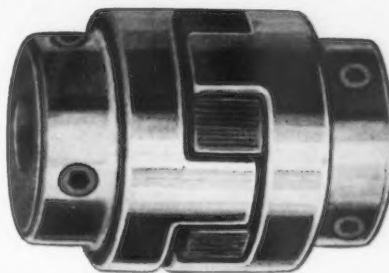
TRUSTEES for the Colorado Fuel & Iron Co. report that consolidated profit of the company, including subsidiaries not in receivership, amounted to \$726,270 in the first quarter of 1936, interest, depreciation, depletion and other expenses being deducted. For the same quarter of 1935 net profit was \$51,490.

Officers and directors of the Colorado Fuel & Iron Corp., meeting for the first time since the final reorganization of the company was approved last week in Federal District Court, elected Arthur Roeder as president. Named to serve under Mr. Roeder are W. A. Maxwell, Jr., vice-president; S. G. Pierson, vice-president and treasurer; Newell H. Orr and Thomas Aurelius, vice-presidents; and D. C. McGrew, secretary.

## Steel Industry Finally Out of Red in 1935

IN 1935, for the first time since 1930, the steel industry as a whole was out of the "red," showing aggregate net earnings of \$62,961,961 after payment of all charges but before dividends, according to financial reports received by the American Iron and Steel Institute from 127 companies rep-

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resenting more than 90 per cent of the invested capital of the industry.

An aggregate loss of \$14,703,536 was incurred by the same companies in 1934, while the industry as a whole is estimated to have lost \$285,000,000 during the period 1931-1934.

Payrolls of the 127 companies during 1935 were more than 20 per cent greater than in 1934, totaling \$695,323,672 as against \$575,172,072 the year before.

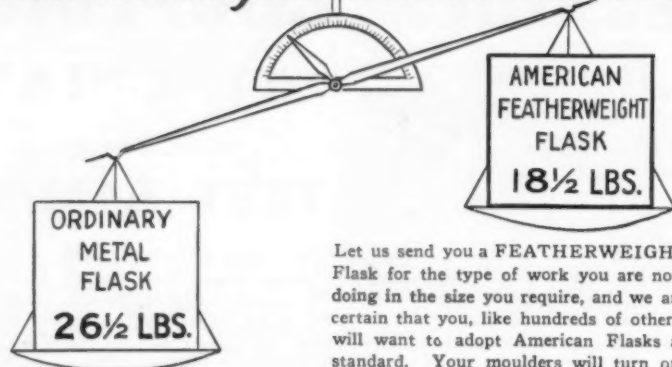
Dividend payments in 1935 to the 551,832 stockholders of the companies amounted to \$38,926,401, equivalent to only 5c. in



If it's V-Belt Cast Iron Sheaves—we are specially tooled to produce any quantity up to 18" diameter at prices that will surprise you.—Write us your requirements.

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The American FEATHERWEIGHT Flasks are competitive in price but are not competitive in quality as they so far exceed ordinary metal flasks or wood flasks, that it is impractical to make comparison here.

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dividends for each dollar paid to employees of the companies. In 1934 a total of \$21,494,711 in dividend payments amounted to only 4c. for each dollar going into pay-rolls.

Employment in the industry increased during 1935, when an average of 424,292 employees were on the payrolls of companies in

the iron and steel industry, as against average employment of 409,349 during 1934. Total employment in the 127 companies, including certain of their subsidiaries which do not produce iron and steel products, was 547,112 on December 31 of last year. Comparable employment figures for 1934 are not available.

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ARMSTRONG Socket Wrenches offer all of the advantages of quick assembly: drivers, handles, extensions, ratchets—the full range of sizes and in addition *rigidity*.

With the patented Drivelock ARMSTRONG has brought socket wrenches up to industrial standards of strength and safety. A quarter turn of the lock pin locks socket to driver, driver to ratchet, extension to extension. Build up a tool of any length—each unit locks securely to the others. Regardless of size or shape this "1-piece" assembly will not pull, pry or knock apart.

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*"The Tool Holder People"*

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## PERSONALS

JOSEPH L. BLOCK has been named executive vice-president in charge of sales, and ALBERT C. ROETH has been made vice-president and general manager of sales for Inland Steel Co. Mr. Block has been associated with Inland since 1922. He has been a vice-president since 1929 and a director since 1930. For a number of years he has been in charge of the sale of bars and semi-finished steel, and has also directed the company's advertising activities. Mr. Roeth has been with Inland since 1911, and has been a vice-president since 1929. He has been in charge of the sale of structural shapes, plates and sheet piling.



J. L. BLOCK

CHARLES T. SCANNELL, general manufacturing manager, Buick Motor Co., Flint, was recently feted at a testimonial dinner marking the 30th anniversary of his connection with the company. During that time he has risen from a lathe hand in the first axle factory to the position of full responsibility for all Buick manufacturing. He joined the company as a machinist and tool maker in May, 1906, and the following year became assistant foreman in the lathe department. In 1908, he became general foreman of the axle plant and served in that capacity for eight years before becoming assistant superintendent in 1917 and superintendent of this division in 1918. In 1923 he became superintendent of the engine plant and for the next 10 years was in charge of the manufacture of all Buick engines. In 1926 he became



factory manager of both the crankshaft and engine plants, in which capacity he remained until 1934, when he was appointed to his present position at the time HARLOW H. CURTICE became president of Buick.

♦ ♦ ♦

CHARLES A. DOSTAL, manager of the merchandise division, Westinghouse Electric & Mfg. Co., has been elected president of the Rotary Club of Chicago, parent club of the international organization.

♦ ♦ ♦

JAMES E. DE LONG, heretofore vice-president of the Waukesha Motor Co., Waukesha, Wis., has been elected president to fill the vacancy caused by the death of Harry L. Horning. He is succeeded as vice-president by JAMES B. FISHER, chief engineer. Mr. De Long became associated with the concern in 1923 as field engineer in the oil industry. Mr. Fisher entered the engineering department in 1914 as chief of design.



A. C. ROETH

His association with the War Industries Board in the design of the Class B Liberty truck engine brought him distinction as an executive as well as an engineer.

♦ ♦ ♦

ARTHUR H. PETERS has been placed in charge of manufacturing at the plant of the American Ironing Machine Co., Algonquin, Ill. He has been active in the household washer and ironer industry for 35 years.

♦ ♦ ♦

E. ARTHUR TRAVIS, export sales manager of the National Enameling & Stamping Co., Milwaukee, has been elected chairman of the newly organized Wisconsin Exporters' Club. E. F. HARTERT, Line Material Co., is vice-chairman; RALPH LOEFFLER, Harley-Davidson Motor Co., treasurer, and Mrs. MARGARET M. DOLAN, of the

## Here They Are!... the STANOIL Sextette!



## they've "Got Everything!"

Unusually high stability . . . Excellent demulsibility . . . Low pour test . . . Good viscosity index . . . Low carbon-forming tendency . . . Excellent color

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### STANDARD OIL COMPANY (Indiana)

### CORRECT LUBRICATION

export trade division of the Milwaukee Association of Commerce, is secretary.

♦ ♦ ♦

SOL EINSTEIN, since 1920 chief engineer of the Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati, has been elected a vice-president of the company. He started with the company in 1903 as a tracer, becoming next a detailer and designer. He rose steadily until he reached the position of chief engineer. His

duties include special engineering and patent matters.

♦ ♦ ♦

R. M. GUIRY, who has been identified for the past nine years with the Chicago office of the Kennedy Valve Mfg. Co., Elmira, N. Y., has been made manager of the Chicago branch office and warehouse.

♦ ♦ ♦

JAMES P. ALLEN, formerly president of the Union Steel Casting Co., Pittsburgh, has been made

vice-president of the Machined Steel Casting Co., Alliance, Ohio,



J. P. ALLEN

and will be in charge of the company's Pittsburgh office at 1622 Oliver Building.

♦ ♦ ♦

LOUIS JOSTER, of the Beck & Corbitt Co., St. Louis, has been elected president of the St. Louis chapter of the American Steel Warehouse Association. MILNER DONOVAN, of the Donovan Iron & Supply Co., has been made secretary.

♦ ♦ ♦

W. S. CHASE, who for many years was general sales manager of the National Acme Co., Cleveland, has been appointed National Acme sales manager for the West Coast district. He will advise and assist the present agencies of the company in that territory.

♦ ♦ ♦

L. W. GROTHAUS, formerly assistant to the president of the Allis-Chalmers Mfg. Co., Milwaukee, has been elected a vice-president.

♦ ♦ ♦

J. W. BRAFFETT, for the past seven years Detroit representative of the Oliver Iron & Steel Corp., has joined the Detroit sales staff of the Republic Steel Corp., Upson Nut division. He is a graduate of the school of mechanical engineering of Cornell University and has had a varied career as sales engineer.

♦ ♦ ♦

G. E. MAHONEY, formerly a sales engineer in the Milwaukee offices of the Chain Belt Co., has been transferred to the company's Pittsburgh office, which has been moved to the Grant Building.

♦ ♦ ♦

J. S. McKEIGHAN has been transferred to the sales staff of the

# NEW DEVELOPMENTS BY STEARNS ENGINEERS IN MAGNETIC EQUIPMENT

- CONCENTRATION
- SEPARATION
- PURIFICATION
- PROTECTION
- POWER TRANSMISSION

## THE TYPE "DH"

Because of its very deep, intensely concentrated magnetic field, finely ground or pulverized material—ores, clays, minerals—can be successfully refined, and magnetically reluctant particles removed with the Stearns Type DH Magnetic Separator. Operates with a magnetic drum lifting the magnetic particles, thus avoiding entrainment and keeping loss in the "tails" to a minimum. Automatic separation and discharge; has special vibrating device to provide proper feeding.

The Type DH is one of many recent developments in magnetic equipment by Stearns magnetic engineers. We maintain a fully



equipped Magnetic Research and Testing Department . . . your magnetic problem, whether separation, processing, or power transmission—magnetically—will soon find a practical solution here. Write for complete information.

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**HIGH**  
**STEARNS**  
**DUTY**  
**MAGNETIC EQUIPMENT**



Dayton office of the Lincoln Electric Co., Cleveland. J. B. McCORMICK, heretofore in the company's Philadelphia office, has been stationed at 3160 Montecito Avenue, Fresno, Cal., and PAUL W. JAMES has been transferred from the factory to the company's office at Binghamton, N. Y.

O. R. HEIDENRICH, formerly district manager of the Ready-Power Co., and J. M. HAWKINS have formed Pennell Engineering Associates, Pittsburgh, and will handle Elwell-Parker Electric Co. equipment and other material systems.

J. M. HILBISH, manager of the Pittsburgh warehouse of the Jones & Laughlin Steel Corp., has been elected president of the Pittsburgh chapter of the American Steel Warehouse Association. T. A. HARPER, Edgar T. Ward's Sons Co., has been elected secretary; WILLIAM L. ABBOTT, McKee-Oliver, Inc., treasurer, and R. J. STAYMAN, general manager of warehouses, Jones & Laughlin Steel Corp., national director.

H. E. MENSCH has been appointed district sales agent for the Michigan territory, with office in the Book Building, Detroit, for the Ohio Locomotive Crane Co., Bucyrus, Ohio.

JAMES E. NOLAN has been appointed purchasing agent for the Scullin Steel Co., St. Louis. HARRY C. DREIBUSS has been made chief mechanical engineer, and JAMES GLOVER and R. C. GEEKIE have been added to the sales department.

T. HOLLAND NELSON, consulting engineer, has been made chairman of the Philadelphia chapter of the American Society for Metals. CHARLES H. STOECKLE, Crucible Steel Co. of America, has been made vice-chairman, and ADOLPH O. SCHAEFER, Midvale Co., has been made secretary-treasurer.

ROBERT SINCLAIR, manager of the Buenos Aires office of the Allis-Chalmers Mfg. Co., is spending several weeks at the general offices in West Allis, Milwaukee.

ROBERT J. WILSON has been appointed general manager of the Western Metal Specialty Co., Milwaukee, manufacturing freight car heaters, farm sanitation, motor truck stampings, etc. He was at one time president of the Kemp-smith Mfg. Co., Milwaukee, manu-

facturer of milling machines, and more recently executive vice-president of the Endestro Mfg. Co., Chicago.

E. E. BRADWAY has been elected vice-president in charge of operations, Desplains, Ill., Benjamin Electric Mfg. Co.; J. HORTON FALL, vice-president and general sales manager; B. G. KODJBANOFF, vice-president in charge of the Eastern division; MILES F. STEEL, vice-president in charge of the Pacific

Coast division; C. B. HARLOW, vice-president in charge of the central division; C. F. W. ALFVIN secretary and assistant treasurer, and D. S. HAZEN, comptroller and assistant secretary.

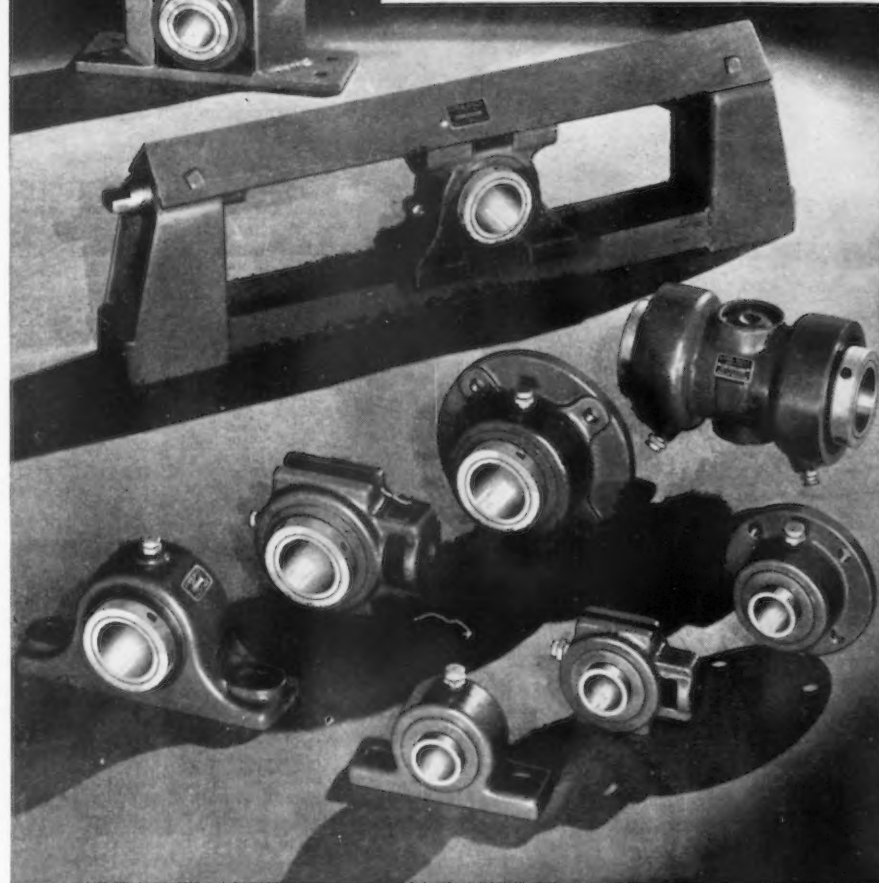
RAY H. MCMASTERS, formerly Pittsburgh representative for Logan Iron & Steel Co., Philadelphia, has been named sales engineer for Sauereisen Cements Co., Sharpsburg, Pa.

## A Power Transmission Line that Offers Real Economy



# LINK-BELT

## ANTI-FRICTION BEARING UNITS



● For lower power consumption, longer service life, better appearance, less lubrication, minimum plant maintenance expense—standardize on the Link-Belt line—anti-friction bearings in Link-Belt streamlined mountings. Send for Book No. 1520. Return the coupon.

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## Machine Tool Builders Engage in Economic Discussion at Chicago

**O**PTIMISM prevailed among the membership of the National Machine Tool Builders' Association, gathered at the Edgewater Beach Hotel, Chicago, May 12-13, for its thirty-fourth spring convention.

Special significance was given to the gathering through presen-

tation of a medal, indicating the award of merit recently bestowed upon the association by the American Trade Association Executives for outstanding achievement by a trade association during the past three years.

President Norman D. MacLeod, in his opening address, outlined

association aims and activities as they have pertained to his term of office. He was followed by Herman H. Lind, general manager of the association, who brought to the fore some of the problems which remain to be disposed of in attaining a more regularized and orderly procedure of industrial activity, with resultant employment benefits, particularly among both builders and users of machine tools.

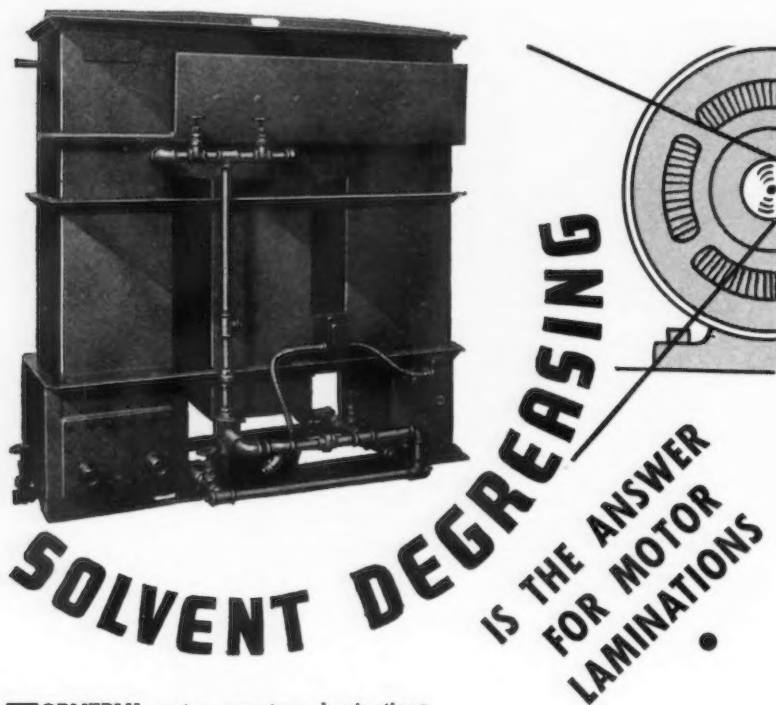
As guest speakers, at the morning session, May 11, H. L. McCarthy, dean, College of Commerce, DePaul University, Chicago, talked on "Labor Economics in 1936." The presentation covered various wide range aspects of today's manufacturing, management and price problems as viewed by the many agencies of diverse opinion. Probabilities of legislative action, and results from, a shorter work week were included.

During a discussion period which followed, the membership was treated to an exchange of viewpoints between former association president, Ralph K. Flanders, and Dean McCarthy. Interest was increased because of the fact of Dean McCarthy's considerable association with NRA labor disputes. Mr. Flanders has long been a successful builder of machine tools.

As guest speaker at the evening dinner session, Dr. Glenn Frank, president, University of Wisconsin, pointed out a now clearly evident necessity, that we guard against the stabilization of want, through a more consistent utilization of research and equipment for the production of more abundance at lesser costs. True capitalism, said Dr. Frank, is flexible in its operation, and contrasts with many immediate ideas of political receivership control of business as the solution to American economic problems.

## New Timken "SILMO" Steel Introduced

**T**HE Timken Steel & Tube Co. has just announced a new steel designated as "Silmo," especially designed for applications where an economical combination of high temperature strength and oxidation resistance is required. In the temperature range of 1000 deg. to 1200 deg. F. Silmo steel has about twice the strength of carbon steel and its oxidation resistance compares favorably with that of 4-6 per cent Cr-Mo steel. This new steel may be used to replace carbon steel where greater safety is required and as a substitute for



**F**ORMERLY motor armature laminations made by one of the large motor manufacturers of this country were cleaned in an alkali solution and dried in sawdust. This took from one to two hours per batch. Because the laminations nested together the cleaner frequently failed to reach all greasy surfaces and the oil that remained would later work out to foul the stator. The result was always service of a more or less costly nature.

In this Detrex Three Dip Degreasing Machine the entire process is completed in three minutes and there is no residual oil. Parts are simply dipped in the boiling chamber, rinsed in the middle chamber and vapor dried in the third chamber. On emerging they are ready for final finishing.

Detrex Degreasing has also saved electrical maintenance men a great deal in both time and expense, especially in reconditioning motors.

*If you are interested in reducing costs and speeding cleaning procedure, write for bulletin on Solvent Degreasing.*

## DETROIT REX PRODUCTS CO.

Formerly Rex Products & Manufacturing Co.

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the standard carbon molybdenum steel where oxidizing conditions are encountered. Indicated uses for Silmo steel lie in the field of cracking furnace tubes, pipe still heater tubes, high pressure boiler and superheater tubes, and tubing used in the manufacture of air heating equipment.

Complete physical data on Silmo steel covering high temperature tensile properties, Charpy value at elevated temperatures, heat embrittlement tests, creep strength. Temperature-stress embrittlement tests, stability, and corrosion and oxidation resistance, together with curves showing the creep strength of Silmo steel at various temperatures and the relation between its creep strength and rate of creep at 800 deg., 1000 deg. and 1200 deg. F. are presented in a series of six looseleaf pages available on request to the Timken Steel & Tube Co., Canton, Ohio, or any of its branches.

## Franco-American Trade Agreement

WASHINGTON, May 12.—Concessions granted by France to the United States in the Franco-American reciprocal trade agreement, announced today by the Department of State, cover such products as automobiles, electric household refrigerators, tractors and agricultural machinery, steam engines, printing presses, pneumatic tools, and other small tools.

Among concessions granted by the United States, was a reduction from 25 to 15 per cent ad valorem in the duty on cast iron pipe and fittings. There were no such imports from France last year. This is attributed chiefly to the fact that the French product is high in phosphorus.

Except for automobile chassis, the concessions applying to these products are entirely in the nature of supplementary quotas. On chassis for automobiles, except for buses, a reduction of 50 per cent in the minimum duties has been granted and the annual quota increased to 3062 quintals from present quota of 932 quintals. (One quintal equals 2204 lb.)

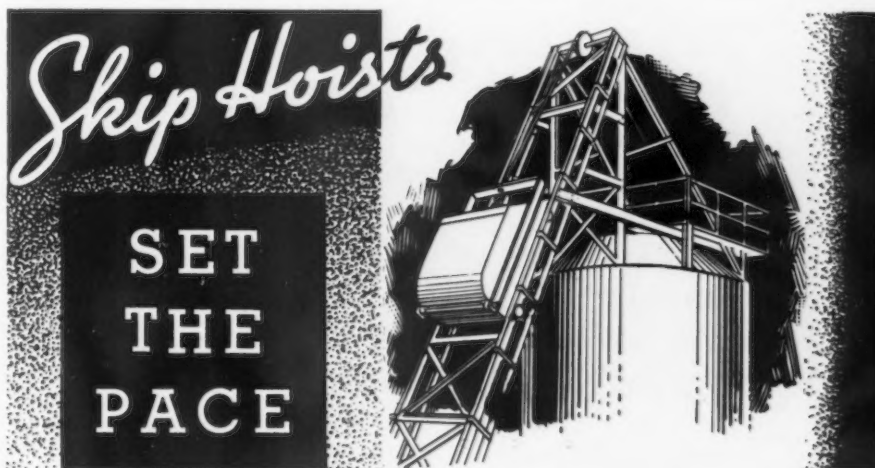
The agreement becomes effective June 15 and will continue until July 1, 1937, and indefinitely thereafter until six months after notice of termination has been given by either country, subject under exceptional conditions to modification or earlier termination.

Supplementary quotas have also been granted for passenger cars

with bodies, 3331 quintals and for bodies and parts of bodies, 3419 quintals, in addition to the present quotas of 6512 and 4848 quintals respectively.

A supplementary quota of 500.2 quintals has been granted for electric household refrigerators and a supplementary quota of 200 quintals for refrigerating apparatus, other than electric household refrigerators.

By reason of the trade agreement the United States is assured, with few unimportant exceptions, it will enjoy the most-favored-tariff treatment which France now or hereafter accords to any country. Heretofore many discriminations applied to imports into France from the United States. The agreement is the first comprehensive trade agreement made with France in over a century.



Conveyors  
•  
Elevators  
•  
Drum Painting and Handling Equipment  
•  
Dryers  
•  
Complete Coal and Ash Handling Systems for Boiler Plants  
•  
Chains, Sprockets, Buckets  
•  
Dust Collectors  
•  
Skip Hoists  
•  
Foundry Sand Handling Equipment

SKIP HOISTS, invented by Bartlett-Snow engineers in 1905, provide unsurpassed economy in handling coal, ash, coke, sand, limestone and other corrosive and abrasive materials . . . especially when the lift is high—the loading heavy.

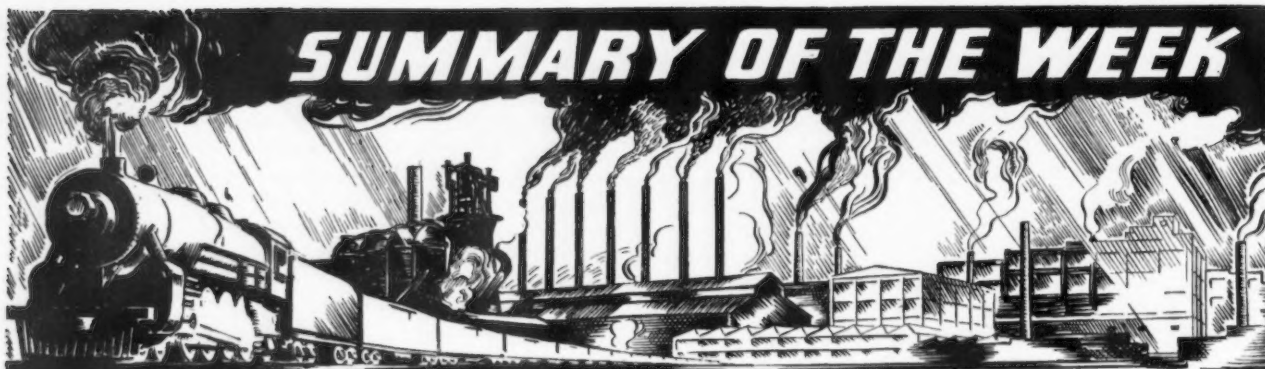
First cost is moderate, little or no more than less efficient equipment. Maintenance and operating charges are much reduced as the material does not come in contact with any moving parts.

Semi-automatic and fully automatic types are included in the complete line. Sizes to meet any requirement. Full details and a copy of Bulletin No. 73, complete with diagrams, etc., on request. Send for one.

**THE C. O. BARTLETT & SNOW CO.**  
6202 Harvard Avenue Cleveland, Ohio  
In New York— 30 Church Street In Chicago— First National Bank Bldg.

**BARTLETT-SNOW**  
*Skip Hoists*  
TRACK HOPPERS—LOADING GATES—HOIST ENGINES  
BUNKERS—BINS—CHUTES—WEIGH LARRIES





## SUMMARY OF THE WEEK

**... Increased costs force steel producers to consider third quarter price advances.**

o o o

**... Output exceedingly well maintained for this season, with production off only half a point to 67½ per cent of capacity.**

o o o

**... Expected orders for 25,000 freight cars in first five months will do much to sustain summer operations.**

LABOR agitation, the granting of vacations with pay to wage-earners and pending tax legislation have focused the attention of steel producers on prices. Advances on many finished products are naturally being considered, but no important producer has determined any definite policy on the subject. It is certain that no decision can be reached before June 1, and if higher prices should be announced at that time, consumers would be given ample opportunity to cover their summer needs at current levels.

THE experience of the industry has proved that mid-year price advances are not desirable. Demand is invariably declining at that time, and even though orders can be sharply stimulated during June by such action, business suffers accordingly in July and August. This occurred in 1934 when the third quarter was one of the poorest in the industry's history. A similar set-back was suffered the year before after the inception of the NRA.

It is unquestionably true that production costs are being increased by discriminatory New Deal legislation, but the steel industry realizes only too well that the laws of supply and demand cannot be flaunted by practical business policy even though political expediency may lead to any sort of untried theory.

IN the meantime, the trend of steel demand remains extremely encouraging. Ingot production has declined only half a point to 67½ per cent of capacity, with output in many important districts remaining unchanged. Raw steel is being accumulated at a few plants, but finishing mill schedules are well sustained and mill backlogs are sufficiently large to prevent any sharp decline in output for at least another month.

The automobile industry is contributing heavily to the maintenance of business, as it now seems likely that May assemblies will compare favorably with the heavy April output. Some tonnage is already being placed for June delivery, but parts makers are curtailing their takings as the first step in reducing inventories in anticipation of model changes. The extent of the June decline in motor car production cannot be gaged at this time, but it does not promise to be any more severe than had been expected for this month.

FREIGHT CAR construction promises to be an important factor in bolstering steel output against the automotive decline. The year's car awards have amounted to 13,300 units, compared with scarcely 1500 in the corresponding 1935 period. Bids are in on an additional 5900 cars and inquiries for another 5800 are before the trade. Thus car orders in the first five months will total 25,000, or more than in any full year since 1930.

New freight car inquiries include 2800 from the Southern Pacific, 1000 from the Norfolk & Western and 2000 from the Missouri Pacific. The Milwaukee Road is soon expected to enter the market for 1500 and the New York Central is considering an ambitious program for rolling stock purchases.

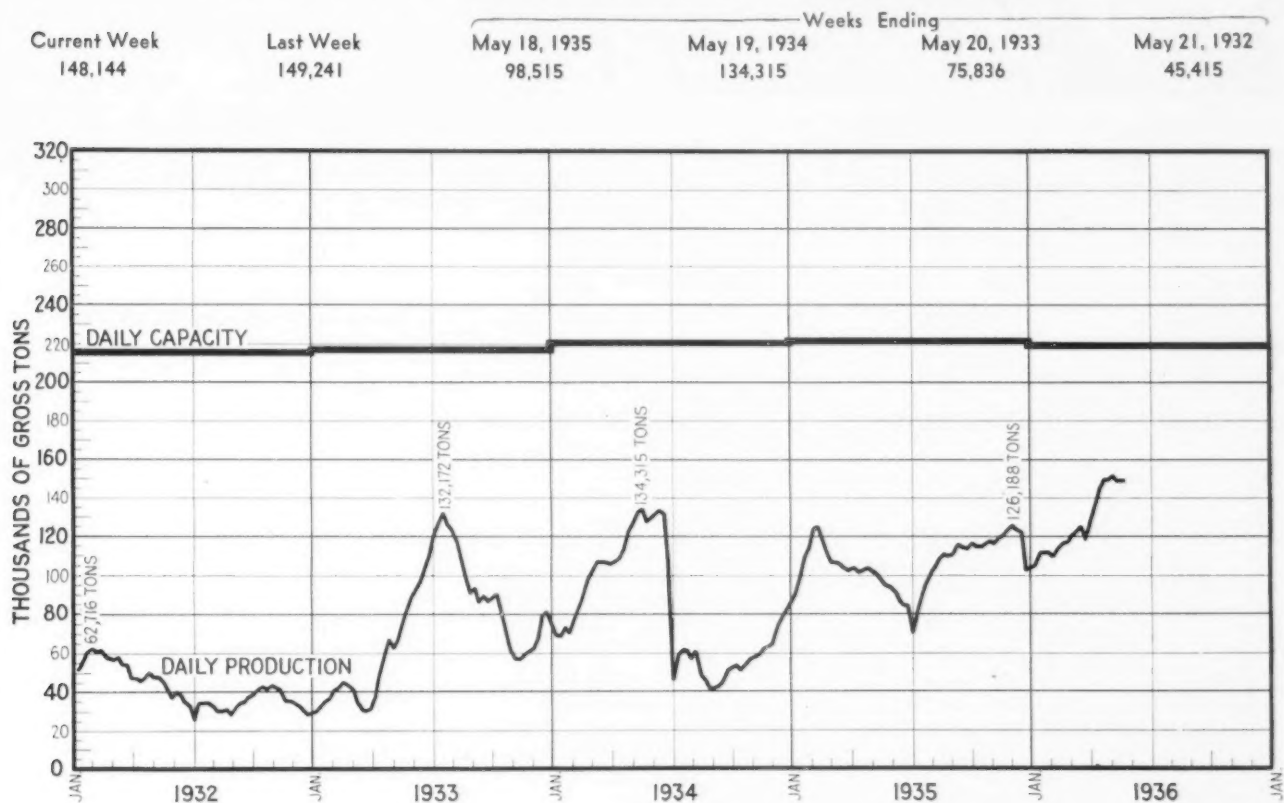
CONSTRUCTION activity is a less spectacular market factor. The week's fabricated structural steel lettings total 21,300 tons, compared with 14,400 tons last week, while new inquiries declined from 16,100 tons to 9500 tons. Pipe-line construction is of growing importance and revival of long dormant plans for a second natural gas line from the Mid-Continent field to Chicago is considered.

THE scrap market is a depressing factor. Declines in heavy melting steel quotations at Chicago and Philadelphia have forced THE IRON AGE scrap composite down 41c. a gross ton to \$13.42, or \$1.33 a ton under the year's high level and only 9c. above the 1936 low. However, stabilizing tendencies are manifesting themselves. The pig iron and steel composites are unchanged.



## STEEL INGOT PRODUCTION

Daily Tonnage of Bessemer and Open-Hearth Steel Ingots Produced by Weeks, 1932-1936



### STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

District	Current Week	Last Week	Weeks Ending		
			April 18, 1936	May 18, 1935	May 19, 1934
Pittsburgh	62.0	63.0	64.0	36.0	50.0
Chicago	67.0	67.0	68.0	52.0	64.0
Valleys	73.0	73.0	72.0	51.0	65.0
Philadelphia	45.0	45.0	45.0	32.0	46.0
Cleveland	72.0	76.0	79.0	43.0	67.0
Buffalo	70.0	66.0	58.0	30.0	62.0
Wheeling	90.0	90.0	80.0	77.0	79.0
Southern	67.0	67.0	67.0	50.0	63.0
Ohio River	80.0	85.0	78.0	70.0	60.0
Western	80.0	80.0	90.0	30.0	35.0
St. Louis	77.5	80.0	80.0	21.0	60.0
Detroit	100.0	100.0	100.0	95.0	100.0
Eastern	85.0	90.0	90.0	35.0	35.0
Aggregate	67.5	68.0	68.0	44.5	61.0
Average Year to Date	58.1	57.6	55.5	48.3	45.6

## Weekly Booking of Construction Steel

FROM THE IRON AGE

	Week Ended				Year to Date	
	May 12, 1936	May 5, 1936	Apr. 14, 1936	May 14, 1935	1936	1935
Fabricated structural steel awards.....	21,315	14,400	10,575	6,700	382,100	299,650
Fabricated plate awards.....	6,960	5,360	600	1,495	110,470	67,160
Steel sheet piling awards.....	150	145	200	1,200	15,700	14,965
Reinforcing bar awards.....	3,710	5,455	3,500	1,500	145,930	102,330
Total Lettings of Construction Steel..	32,135	25,360	14,875	10,895	654,200	484,105



*... Output maintained at Wheeling and off only one point at Pittsburgh.*

o o o

*... Well sustained demand indicates that downturn will be at much slower pace than recent increase.*

o o o

*... Third quarter price policy still undetermined.*

PITTSBURGH, May 12.—A continuation of the well diversified demand for steel this week is responsible for the present more or less stable operating rate in the Pittsburgh district. Operations have declined only one point to 62 per cent of capacity. Ingot output in the Wheeling district remains at 90 per cent.

Activity over the past two weeks, in which declines have been registered in steel ingot output, seems to bear out the contention that the leveling off process will continue at a slower rate than that experienced on the up-grade. Production of heavy materials, such as plates and shapes for railroad car and barge building, is no doubt doing its part in maintaining present activity. Barge construction in this district received a further impetus with the awarding of a contract to the Bethlehem Steel Co., Leetsdale, Pa., shops for 29 coal barges, requiring about 4500 tons of steel plates and shapes, to be delivered to the Hatfield-Campbell Creek Coal Co., Cincinnati.

Demand for semi-finished steel is holding up well, due to movement of rerolling billets and also to the heavy requirements for tin plate and sheet operations. Interest in hot-rolled bars is progressing at the recent pace, and mills are being pushed daily for shipments on these items.

Attention of reinforcing bar manufacturers was centered this week on the announcement that the

Government had rejected all bids on 3000 tons of concrete bars to be used on the Fort Peck Dam project. Nothing definite has been decided as to how this order will be handled. However, there is a possibility that it may be considered as excess on lots previously awarded.

Demand for wire products, while holding up as far as manufacturing wire is concerned, still suffers from a lull in merchant demand. Wire prices are firm in this district, despite reported weakness, confined exclusively to jobbers, in other districts.

Specifications for sheets are slightly off. However, production remains at 72 to 75 per cent. Activity in the tin plate industry is at 90 to 92 per cent. Makers of oil cans are pushing mills for immediate shipment following recent hot weather.

There is no unusual activity in the raw commodity markets this week.

#### **Pig Iron**

Practically all contracts for pig iron at the old prices have been cleaned up, and all iron being taken now is at the recent new price. While buying is on a hand-to-mouth basis, due to stability of quotations, nevertheless takings are in fairly good lots, due to continued activity in foundries. As a result of the better ingot rate over the past two months, production of molds has been improving.

#### **Semi-Finished Steel**

The maintenance of good operations in both sheet and tin plate mills is responsible for the steady movement of sheet bars to non-integrated mills. During the past week the slight decrease in the specifying for billets previously reported has been overcome with the appearance of a better volume of bookings for material of this nature.

#### **Bolts, Nuts and Rivets**

Demand so far this month is progressing at a rate above that for the same period during April. Increasing tonnages are being placed by railroad car builders, and bookings from automotive sources are holding up well. Aggregate demand is improving, with much material going into unclassified tonnage.

#### **Bars**

Both demand and shipments of hot-rolled bars have shown no change during the past week, the recent improvement having held. A wide diversification still continues to be the bright spot in this market, and at this time there is no evidence of any sharp let-up in demand. As yet there has been no tendency on the part of consumers to do much forward purchasing, with the result that mills are continually being pushed for shipments, thus signifying that practically all material being purchased and shipped is going into immediate consumption.

#### **Reinforcing Steel**

All bids on the 3000 tons of reinforcing steel to be used on the Fort Peck Dam project have been rejected "for the best interests of the United States." There is a possibility that the tonnages for this particular job will be placed as excesses on lots previously awarded by the Government. Meanwhile production and shipment of concrete bars is progressing at the recent accelerated rate, due to daily releases. There has been a little new business, however, that has been spotty in nature. Increased hot-rolled bar business has in a small measure probably relieved some of the tension in the concrete bar situation, inasmuch as some of the smaller units who have been using their hot-rolled bar capacity to manufacture reinforcing bars have reverted to their original mill practice.

#### **Cold-Finished Bars**

Demand in this market is perceptibly better than a week ago. While requirements from automotive people continue at recent

# A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous;  
Advances Over Past Week in Heavy Type, Declines in Italics

## Rails and Semi-finished

Per Gross Ton:	May 12, 1936	May 5, 1936	Apr. 14, 1936	May 14, 1935
Rails, heavy, at mill.....	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2
Light rails, Pittsburgh.....	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh.	28.00	28.00	28.00	27.00
Sheet bars, Pittsburgh.....	28.00	28.00	28.00	28.00
Slabs, Pittsburgh.....	28.00	28.00	28.00	27.00
Forging billets, Pittsburgh...	35.00	35.00	35.00	32.00
Wire rods, Nos. 4 and 5, P'gh	38.00	38.00	38.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	1.80	1.80	1.80	1.70

## Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.85	1.85	1.85	1.80
Bars, Chicago.....	1.90	1.90	1.90	1.85
Bars, Cleveland.....	1.90	1.90	1.90	1.85
Bars, New York.....	2.20	2.20	2.20	2.15
Plates, Pittsburgh.....	1.80	1.80	1.80	1.80
Plates, Chicago.....	1.85	1.85	1.85	1.85
Plates, New York.....	2.09	2.09	2.09	2.09
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago..	1.85	1.85	1.85	1.85
Structural shapes, New York	2.06 1/4	2.06 1/4	2.06 1/4	2.06 1/4
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	1.95
Hot-rolled strips, Pittsburgh.	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary.....	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh..	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary...	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh.....	2.10	2.10	2.10	2.60
Wire nails, Chicago dist. mill	2.15	2.15	2.15	2.65
Plain wire, Pittsburgh.....	2.40	2.40	2.40	2.30
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.35
Barbed wire, galv., Pittsburgh	2.60	2.60	2.60	3.00
Barbed wire, galv., Chicago dist. mill.....	2.65	2.65	2.65	3.05
Tin plate, 100 lb. box, P'gh.	\$5.25	\$5.25	\$5.25	\$5.25

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detail price tables.

## Pig Iron

Per Gross Ton:	May 12, 1936	May 5, 1936	Apr. 14, 1936	May 14, 1935
No. 2 fdy., Philadelphia.....	\$21.3132	\$21.3132	\$21.3132	\$20.3132
No. 2, Valley furnace.....	19.50	19.50	19.50	18.50
No. 2 Southern, Cin'ti.....	20.2007	20.2007	20.2007	19.13
No. 2, Birmingham.....	15.50	15.50	15.50	14.50
No. 2 foundry, Chicago*.....	19.50	19.50	19.50	18.50
Basic, del'd eastern Pa.....	20.8132	20.8132	20.8132	19.76
Basic, Valley furnace.....	19.00	19.00	19.00	18.00
Malleable, Chicago*.....	19.50	19.50	19.50	18.50
Malleable, Valley.....	19.50	19.50	19.50	18.50
L. S. charcoal, Chicago.....	25.2528	25.2528	25.2528	24.2528
Ferromanganese, seab'd car- lots.....	75.00	75.00	75.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

\*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

## Scrap

Per Gross Ton:				
Heavy melting steel, P'gh...	\$14.75	\$14.75	\$15.75	\$11.50
Heavy melting steel, Phila...	12.75	13.50	13.75	10.50
Heavy melting steel, Ch'go...	12.75	13.25	14.37 1/2	10.00
Carwheels, Chicago.....	14.00	14.00	14.00	10.50
Carwheels, Philadelphia....	13.75	14.50	14.75	11.25
No. 1 cast, Pittsburgh.....	15.25	15.25	15.25	12.75
No. 1 cast, Philadelphia.....	14.00	14.00	14.25	11.25
No. 1 cast, Ch'go (net ton)...	12.00	12.00	12.50	9.00
No. 1 RR. wrot., Phila.....	14.75	15.00	13.25	10.25
No. 1 RR. wrot., Ch'go (net)	12.00	12.50	13.00	8.00

## Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt.....	\$3.65	\$3.65	\$3.65	\$3.85
Foundry coke, prompt.....	4.25	4.25	4.25	4.60

## Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn....	9.50	9.50	9.50	8.75
Lake copper, New York.....	9.62 1/2	9.62 1/2	9.62 1/2	9.12 1/2
Tin (Straits), New York.....	47.00	46.87 1/2	47.12 1/2	50.75
Zinc, East St. Louis.....	4.90	4.90	4.90	4.20
Zinc, New York.....	5.27 1/2	5.27 1/2	5.27 1/2	4.57 1/2
Lead, St. Louis.....	4.45	4.45	4.45	3.65
Lead, New York.....	4.60	4.60	4.60	3.80
Antimony (Asiatic), N. Y....	13.50	13.50	13.50	14.25

# The Iron Age Composite Prices

## Finished Steel

May 12, 1936	2.097c. a Lb.
One week ago	2.097c.
One month ago	2.097c.
One year ago	2.124c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.

	HIGH	LOW
1936.....	2.130c., Jan. 7;	2.084c., Mar. 10
1935.....	2.130c., Oct. 1;	2.124c., Jan. 8
1934.....	2.199c., April 24;	2.008c., Jan. 2
1933.....	2.015c., Oct. 3;	1.867c., April 18
1932.....	1.977c., Oct. 4;	1.926c., Feb. 2
1931.....	2.037c., Jan. 13;	1.945c., Dec. 29
1930.....	2.273c., Jan. 7;	2.018c., Dec. 9
1929.....	2.317c., April 2;	2.273c., Oct. 29
1928.....	2.286c., Dec. 11;	2.217c., July 17
1927.....	2.402c., Jan. 4;	2.212c., Nov. 1

## Pig Iron

\$18.84 a Gross Ton
18.84
18.84
17.83

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	LOW
1936, Jan. 7;	\$18.84	\$18.84
1935, Nov. 5;	18.84	17.83
1934, May 1;	17.90	16.90
1933, Dec. 5;	16.90	13.56
1932, Jan. 5;	14.81	13.56
1931, Jan. 6;	15.90	14.79
1930, Jan. 7;	18.21	15.90
1929, May 14;	18.71	18.21
1928, Nov. 27;	18.59	17.04
1927, Jan. 4;	19.71	17.54

## Steel Scrap

\$13.42 a Gross Ton
13.83
14.63
10.67

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
1936, Feb. 25;	\$14.75	\$13.33
1935, Dec. 10;	13.42	10.33
1934, Mar. 13;	13.00	9.50
1933, Aug. 8;	12.25	6.75
1932, Jan. 12;	8.50	6.43
1931, Jan. 6;	11.33	8.50
1930, Feb. 18;	15.00	11.25
1929, Jan. 29;	17.58	14.08
1928, Dec. 31;	16.50	13.08
1927, Jan. 11;	15.25	13.08



levels, nevertheless, there have been better bookings from other sources. Quite some tonnage has been booked by manufacturers of textile machinery. Makers of motorcycles have come into the market during the past week for a fair amount of material. Another bright spot in this market is specifications from warehouse people.

### **Steel Sheet Piling**

The Jones & Laughlin Steel Corp. has received the award for approximately 152 tons of steel sheet piling to be used at the All-American Canal at Potholes, Cal. This project is under the direction of the Department of Interior Bureau of Reclamation. The City of Palm Beach, Fla., has taken bids for 210 to 385 tons of piling to be used for groin construction. This project will be in the nature of an experiment in beach improvement, and if successful might possibly result in a far greater tonnage being used for this purpose at a later date.

### **Plates and Shapes**

Orders for heavy materials are showing a tendency to continue their recent strength, due undoubtedly to railroad car builders' backlogs. At the rate railroad cars have been ordered recently it now appears that car shops will be busy far into the summer and, therefore, this will be reflected in a continuation of demand for plates. Material for barges received a stimulant this week when Bethlehem Steel Co., Leetsdale, Pa., shops received the contract for construction of 29 coal barges, requiring about 4500 tons of steel plates and structural shapes. The purchaser is the Hatfield Campbell Creek Coal Co. of Cincinnati.

Structural awards this week were not impressive, with the possible exception of 1610 tons involved in the construction of a press shop for the Chrysler Corp. at Detroit, Jones & Laughlin Steel Corp. receiving the contract. The outstanding public works job was the Kings County, N. Y., Hospital nurses' home and training school, requiring 2100 tons. From a standpoint of private construction inquiries were a little better, four of them being jobs of this nature, the outstanding one involving 1000 tons to be used in alterations to the office building of the United Aircraft Corp. at East Hartford, Conn.

### **Tubular Products**

Demand for tubular products so far this month compares favorably with the same period in April. Specifications for oil country goods, if anything, are slightly better, while movement of standard pipe

from warehouses to consuming channels is at a satisfactory rate. Producers feel that the warehouse people will be increasing their specifications shortly. Aside from rehabilitation work going on in homes, there has been a goodly portion of standard pipe moving into mills and mines where considerable improvements have been taking place. As has been pointed out before the tonnages involved for this type of material are not necessarily of large proportions. However, they are large enough to show a distinct trend of improvement. Mechanical tubing on the other hand is holding to its recent activity.

### **Wire Products**

Demand for manufacturing wire is still holding up, but both improvement and specifications for merchant wire continue their recent inactivity. There has been talk recently of weakness in nail prices. However, such weakness is confined exclusively to jobbers, no change in prices having been received by producers. The 2.10c. per keg, Pittsburgh price, for wire nails is holding firmly in this territory.

### **Sheets**

Specifications have eased off slightly this week, with no definite reason being attributed. Operations, on the other hand, continue at approximately 72 to 75 per cent. Orders are well diversified, and tonnages for car makers are at about the same rate as that reported recently. High refrigerator sales are still being reflected in the steady movement of sheets to manufacturers of this article. Prices remain firm, and the quantity differential set-up is meeting with success, both from the producer and consumer standpoint.

### **Tin Plate**

Operations this week are at 90 to 92 per cent, there having been no let-up in recent consumer demand. An interesting feature in the market this week is the insistent demand from makers of oil cans. As a result of seasonal requirements, packers' specifications are coming in quite freely. Export business continues to make a fair proportion of aggregate tonnage.

### **Strip Steel**

Specifications for hot-rolled strip are at about the same rate as a week ago. Implement makers and manufacturers of household utilities are taking a goodly percentage, with orders from the automotive industry holding up well. Any leveling off in bookings for this product will probably continue at a

slow rate. Meanwhile prices are firm, and the quantity differential set-up as far as both producers and customers are concerned is operating successfully.

### **Coal and Coke**

Movement of industrial coke continues at the recent rate. Current demand for beehive coke has leveled off within the past week. However, production will be maintained fairly well, due to two contracts for blast furnace grades having been placed recently. These contracts will continue for at least three months. Some material is going to a blast furnace at Buffalo, while the balance will be consigned to Standish, N. Y. Coal movement to the Lakes is being held up, partially awaiting the outcome of the Supreme Court's decision on the Guffey bill.

## **Vacations with Pay For Steel Workers**

B. F. FAIRLESS, president B. Carnegie-Illinois Steel Corp., Pittsburgh, has announced that "in response to the request of employee representatives, it has been decided to grant for the current year vacations with pay to employees with five or more years of continuous service." Details of the plan will be developed later.

As a result of a petition from the elected representatives, approximately 10,000 to 12,000 employees of the Jones & Laughlin Steel Corp. will be granted vacations with pay during the current year.

### **Republic Follows Suit**

CLEVELAND, May 12.—Vacations with pay, or at their option, additional pay in lieu of a vacation, will be given during the current year to the employees of the manufacturing departments of Republic Steel Corp., approximately 30,000 in number, according to announcement made by that company. Those who prefer work instead of a vacation will receive in vacation pay during the week preceding Christmas an amount equal to that they would have received had they taken vacations, plus interest.

The plan will cover employees working on hourly, tonnage or piece-work rates and will be available to employees who have a continuous service record with the corporation for five years prior to Dec. 31, 1935, and who are on the payroll at the time of the vacation period.

# CHICAGO



... **Railroad equipment inquiries dominate market picture.**

o o o

... **Production holds at 67 per cent for third consecutive week.**

o o o

... **Scrap prices again decline with heavy melting steel off 50c a ton.**

CHICAGO, May 12.—Steel demand is remarkably steady and output is unchanged at 67 per cent of capacity for the third consecutive week. Consumption is on a broad scale and there are no major disturbing factors in sight for the immediate future.

Of particular importance is the outlook for railroad equipment. The Southern Pacific is in the market for 2800 cars and the Norfolk & Western will buy 1000 cars, to which may be added 1500 cars that the Milwaukee road contemplates putting through its own shops at Milwaukee. Three major western railroads still have initial 1936 rails to purchase and mills are confident that secondary buying will develop during the summer months. These programs are encouraging principally because they give promise of developing steel business at the time when it can reasonably be expected demand from automobile centers will have tapered for the transition period between old and new models. Another heartening development rests with oil producers and refiners. There is already a greater number of short pipe line projects and some long lines are being discussed, among them the second large natural gas main leading from the Southwest to Chicago.

Steel prices in general are on a firm footing and there is considerable discussion of higher quotations for third quarter deliveries on all products with the exception of cold-rolled sheets and strips, these being under the pressure of heavy new capacity which soon will be thrown into the market. High prices, if they come, can be counted on to stimulate mill output

in June, but at a sacrifice to production in July and August.

Consumer pressure has been successful in lowering heavy melting steel prices another 50c. to \$13 a gross ton. Other grades are soft in sympathy with the steel mill grades.

## Pig Iron

May shipments are running 7 per cent ahead of the April average and releases indicate that the current movement will be sustained during the immediate future. New buying remains on a hand-to-mouth

basis, there being no real incentive for consumers to buy ahead. Last week was comparatively quiet while thousands of foundrymen gathered at Detroit.

## Reinforcing Bars

Shops are still being pressed by quick delivery demands and this condition will prevail for two to three weeks longer. This jam is partly accounted for by low and broken stocks in dealers' hands and three to four week's deliveries of reinforcing bars from mills. Bar producers blame delays at their end not so much on rolling schedules as on inability to get 65-ft. cars, which necessitates the slower method of double loading. Low bidders are being announced on the Outer Drive, Chicago, which calls for a fair tonnage split into a number of sections. Actual orders do not bulk large after a 600-ton soap factory is taken out. The outlook for the summer remains mixed. Fresh inquiries are only in fair volume, but most shops look for betterment on the basis of known plans for highway bridges and overpasses. Prices, though not as stable as might be desired, are nevertheless vastly stronger than in the early spring.

## Cast Iron Pipe

Cicero, Ill., has taken bids on about 2500 tons of various sizes up to 30 in. This project is a carry over from last fall when bids were rejected. There is still a substantial amount of WPA work and releases against old public expendi-

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ture projects are brisk. Public utilities remain very quiet and industrial use barely amounts to a dribble.

#### Wire Products

Output is steady, but seasonal factors are beginning to make their appearance and producers are prepared to revise schedules moderately on short notice. Demand from automobile centers remains heavy and if reports from the Detroit area can be relied

upon, June and July will both be good automobile months. Wire producers are counting on heavy buying by automobile interests near the end of May for deliveries to be made in June. Jobbers' reports indicate that business is spotty, but on the whole the average is good. Dealers are rushing through replacement orders and they are selling freely in most areas. Railroad business is confined to light repairs and hope is waning that heavy commitments will be made this year for New York. Prices in the Southwest are on a better basis; that is, there is more uniformity, but the level is low.

#### Rails

The Kansas City Southern has placed 3000 tons of rails with the Carnegie-Illinois Steel Corp. and 1000 tons with Inland Steel Co. In all other respects this market is quiet, though producers are expecting inquiries from the Soo Line, the Northern Pacific and the Grand Trunk. There is still talk of secondary tonnages, but so far no such business has actually developed. Accessory departments are still very busy and new business totals 1200 tons from scattered sources.

#### Bars

A drop in specifications for bar mill products is fairly general and seems to be nothing more than a weekly variation which is not of great importance. One significant point is that automobile centers have not relaxed their insistence upon prompt and quantity deliveries. Automobile builders have not signified their June needs, but the impression is general that the next 30 days, or even longer, are assured as a good business period for this industry. Farm machinery and tractor plant specifications remain liberal and they are counted on to remain so for the next 30 to 60 days. Road machinery manufacturers are enjoying an active late spring business and are using steel freely.

#### Sheets

Consumers are crowding deliveries still harder and the average range now is between four and six weeks. Some mills have depleted roofing stocks and jobbers' supplies are none too plentiful. In several instances mills are breaking records and one unit is operating well above its rated capacity. Prices are steady in the local market and they are more uniform in the Southwest.

#### Structural Material

The Outer Drive, Chicago, which calls for 15,000 tons, still seems to be in somewhat of a muddled

condition although bids have been taken twice. At the original opening the low bidder was above the estimate, but agreed to come within bounds. At the second opening when bids were taken in five sections, it was disclosed that the sum of the five low bids was above the estimate. Once again there must be efforts to adjust the prices quoted, but this time with five contractors. Specifications for structural materials are close to the best of the year and sales match well with releases. Grade elimination and state highway bridges form the bulk of current business.

#### Plates

Mills are faring better and the future is more promising than for some time past. Demand for steel pipe is improved, though by far the largest number of plans are for short runs. However, there is some chance that the second gas line to Chicago which will be an undertaking of major proportions may soon be revived. The Southern Pacific is in the market for 2800 cars and the Norfolk & Western will buy 1000 coal cars. It is not beyond the realm of possibility that the Milwaukee Road will construct 1500 cars in its shops at Milwaukee. If this railroad equipment business develops as it now promises, it will throw steel tonnage into the market about the time that automobile demand is expected to taper. Car builders have ordered out 2000 tons of steel and most railroad shops are busy, some of them to the point where they are handicapped by the lack of skilled labor.



Harwich, Mass., has awarded 1600 tons of pipe, mostly 10-in., to United States Pipe & Foundry Co.

Barnstable, Mass., will close bids May 26 on about eight miles of water pipe and fittings.

Brockton, Mass., has awarded 4000 ft. of 6 in. to Warren Foundry & Pipe Corp.

Framingham, Mass., has taken bids under advisement for 7000 ft. of 6 and 8-in.

Elm City, N. C., closes bids May 19 for water pipe, connecting present system with new 75,000-gal. elevated steel tank and tower, 80-ft. high, for which bids are asked at same time. W. L. Trevathan & Co., Wilson, N. C., are consulting engineers.

United States Engineer Office, Vicksburg, Miss., asks bids until June 2 for 6890 ft. of 10, 12 and 14-in., for new outfall sewer system at Greenville, Miss., and vicinity to Warfield Point on Mississippi River, including pumping station and equipment.



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**Rushsylvania, Ohio**, plans pipe lines for water system; also other waterworks installation. Financing is being arranged through Federal aid. Carl Simon, Van Wert, Ohio, is consulting engineer.

**Manitowoc, Wis.**, Public Utilities Commission has been authorized by City Council to take bids on 36-in. pipe line into Lake Michigan, to cost \$72,000. Peter Eastman is president of commission.

**Appleton, Wis.**, closes bids May 16 on 2330 ft. of 4, 6 and 8-in., class 250 centrifugal or equal cast iron pipe, for water department.

**Appleton, Wis.**, closes bids May 14 on 870 ft. of 18 and 24-in. for industrial connecting sewers.

**Rapid City, S. D.**, has voted bonds for \$90,000 for new trunk line for water system and other waterworks installation, including development of new source of supply at Canyon Lake Springs. Pipe line will cost about \$64,000 of gross sum noted. H. W. Zolpher is city engineer.

**Summerfield, Kan.**, plans pipe lines for water system; also other waterworks installation and sewerage system. Financing is being arranged through Federal aid. Paulette & Wilson, National Reserve Building, Topeka, Kan., are consulting engineers.

**Oklahoma City, Okla.**, plans about 5000 ft. of 20-in., for emergency service for municipal filtration plant from new source on North Canadian River channel. Cost about \$30,000. Thomas G. Banks is city water superintendent.

**Eudora, Kan.**, has voted bonds for \$31,000 for pipe lines for water system and other waterworks installation, including elevated steel tank and tower. Cost \$54,000, remainder of fund to be secured through Federal aid. Shockley Engineering Co., Graphic Arts Building, Kansas City, Mo., is consulting engineer.

**San Diego, Cal.**, has opened bids on 326 tons of 12 and 16-in. on which United States Pipe & Foundry Co. is low bidder.

**Alhambra, Cal.**, will open bids May 19 on 195 tons of 6 and 8-in., class 250.

**Seattle** will take bids May 14 on 140 tons of 8-in. for East Marginal Way.

**Portland, Ore.**, will take bids May 20 on 495 tons of 6, 8 and 12-in.

**Barnstable, Mass.**, will soon be in the market for cast iron pipe, etc., for a water system to cost about \$130,000.

**Newton, Mass.**, has awarded 18,000 ft. of 6 and 8-in. and 600 ft. of 12-in. to Warren Foundry & Pipe Corp.

**Atlantic City, N. J.**, has secured WPA approval for new 48-in. main water line across meadows from pumping station on mainland. Cost \$839,800. Financing will be carried out through Federal aid.

**Brocton, N. Y.**, closes bids May 11 for pipe line for new auxiliary supply; also for new water filtration station and pumping plant. Charles J. Coughlin is village clerk.

**Board of District Commissioners**, District Building, Washington, asks bids until May 22 for 7376 ft. of 48-in., 5092 ft. of 36-in., and 2910 ft. of 30-in. for water system in different streets.

**Bryson City, N. C.**, plans pipe lines for water system, including replacements in present lines; also other waterworks installation. Fund of \$67,000 is being arranged through Federal aid.

**Cornelius, N. C.**, plans pipe lines for water system; also other waterworks installation. Fund of \$34,000 is being arranged through Federal aid.

**Asheboro, N. C.**, closes bids May 14 for about 12,000 ft. of 12-in., with alternate bids on steel spiral welded pipe, for new raw water line for city system. A. E. Taplin is city engineer.

**Carthage, Ind.**, closed bids May 11 for pipe lines for water system; also for elevated steel tank and tower, pumping station, control equipment, etc. Fund of \$40,000 has been arranged. Lennox & Mathews, Architects' and Builders' Building, Indianapolis, are consulting engineers.

**Neenah, Wis.**, has engaged Alvord, Burdick & Howson, 20 North Wacker Drive, Chicago, as consulting engineers on proposed \$125,000 water filtration and softening plant. H. S. Zemlock is city clerk.

**Albert Lea, Minn.**, plans about 5500 ft. of 6-in. for water system. R. L. Van Nocker, city manager, is in charge.

**Columbia Falls, Mont.**, plans pipe lines for water system; also other waterworks installation, including reservoir improve-

ments. Fund of \$50,000 is being arranged through Federal aid.

**Enid, Okla.**, plans pipe lines for water system. Bond issue of \$140,000 has been authorized for this and other waterworks installation.

**Wallace, Kan.**, plans about 13,600 ft. of various sizes for water system; also for 50,000-gal. elevated steel tank and tower, pumping station and other waterworks installation. Charles W. Suit, Garden City, Kan., is consulting engineer. Financing has been arranged through Federal aid.

**Woodlake, Cal.**, has approved bonds for \$32,000 for pipe lines for water system and other waterworks installation. Lester H. Gadsby, 714 North Willis Street, Visalia, Cal., is consulting engineer.

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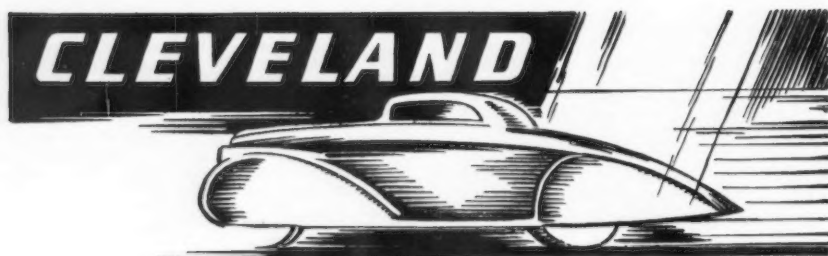
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*... Demand for finished steel is well maintained, with a slight tapering in automotive parts makers' requirements.*

o o o

*... Ingot production declines four points to 72 per cent of capacity.*

CLEVELAND, May 12.—With a wide miscellaneous demand for finished steel, business is holding closely to the level established near the end of the month when there was some recession from the peak that prevailed during the previous two weeks.

With an easing up in the pressure for shipments and the cutting down of backlogs, ingot output in the Cleveland-Lorain district dropped four points this week to 72 per cent of capacity. Two open-hearth furnaces were taken off by a local steel plant. Blast furnace operations are unchanged in this district but in Youngstown the Sheet & Tube company today started up one of its Brier Hill

stacks that had been down for six years.

The motor car industry is not placing a great deal of tonnage at present. It is expected to make new purchases in substantial lots before the end of the month for June production schedules as it is believed that present schedules will be well maintained through the coming month. Releases to some parts makers in this territory have been curtailed somewhat evidently for the purpose of reducing stocks of parts in anticipation of a tapering off of production schedules a little later in the season.

Operations of miscellaneous metal working plants in this district appear to be holding to recent

levels. Many consumers, particularly of bars, are carrying small stocks and want quick deliveries.

Bids for 5900 freight cars for the Chesapeake & Ohio and the Pere Marquette have been taken and these cars are expected to be allocated within a week, releasing considerable tonnage of heavy rolled steel.

With increasing production costs an advance of \$2 to \$3 a ton on steel prices for the third quarter is being discussed. If prices are marked up, an announcement to that effect will probably be made June 1, and would result in the placing of considerable tonnage during June in anticipation of higher prices.

With an increase in supply, scrap has again declined 50c. a ton on most grades.

#### **Pig Iron**

Shipments have increased this month and the gain with a leading Lake furnace interest is 20 per cent over the corresponding period in April. Sales fell off the past week, this being attributed to the large number of foundrymen away from home to attend the convention and exhibition of the American Foundrymen's Association. Foundries are not making commitments for future requirements and new business is confined to small lots. Shipments to automobile foundries continue heavy. However, some slowing down in the demand from this source is looked for shortly.

#### **Sheets**

New business from the motor car industry is somewhat lighter than a few weeks ago but consumers in this and other fields are crowding the mills for shipments. Enameling sheets continue in good demand from the refrigerator, washing machine tub and stove industries and from sign manufacturers.

#### **Strip Steel**

Mills still have good backlogs but the volume of new business has declined. Many plants in the automotive field and miscellaneous consumers still have good stocks. Some new fill-in tonnage was placed during the week by automobile parts makers. The local plant is operating at capacity on wide hot strip, 70 per cent on narrow and 75 per cent on cold-rolled strip.

#### **Iron Ore**

Ore on docks at Lake Erie ports at the opening of navigation May 1 was virtually in the same amount as on the same date a year ago, the dock balance May 1 this year being 4,129,948 tons as against 4,173,204 tons on the same date a year ago. Shipments from these docks of



**INSTANT REVERSAL**  
of air cylinder upon releasing the pedal of this spring return valve simplifies and speeds up operation of arbor presses, riveting presses, and similar air-operated equipment. Hannifin "Packless" Air Control Valves have no packing — and no leakage or maintenance trouble. Write for Valve Bulletin No. 34-A.

**HANNIFIN MANUFACTURING COMPANY**  
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Production Tool Equipment

**HANNIFIN**

**"Packless"  
AIR CONTROL**

**VALVES**

dock storage ore in April were 556,761 tons as against 474,041 tons in April last year.

#### Bolts, Nuts and Rivets

New demand for bolts and nuts from the automotive industry has slackened and makers are getting near the end of their specifications from that source. However, new orders are expected for June shipment. Demand from railroads has improved and miscellaneous business is fair. Shipments by one of the leading producers during April were the best in any month in five years. Rivet orders are slightly better than they have been and pending freight car business is expected to stimulate sales.

#### Bars, Plates and Shapes

Demand for merchant bars continues good from forge shops and miscellaneous consumers. Considerable steel is going to manufacturers of road building equipment, farm tools and power shovels. Business from agricultural implement plants has tapered off. In the construction field 400 tons has been placed for a Toledo factory and an inquiry is out for 250 tons for a Chesapeake & Ohio bridge. Some reinforcing bar distributors in this district have issued prices with a view of eliminating the recent cut-throat competition by publishing open market quotations.



... Awards of 3710 tons  
—1800 tons in new  
projects.

#### AWARDS

Des Plaines, Ill., 165 tons, filter plant, to Calumet Steel Co.; previously reported to an unnamed bidder.

Hammond, Ind., 600 tons, Lever Brothers soap plant, to an unnamed bidder.

Denver, 170 tons, All-American Canal project, to Soule Steel Co.

Denver, 128 tons, All-American Canal project, to Blue Diamond Corp.

Denver, 260 tons, Moon Lake dam, to Colorado Fuel & Iron Co.

Denver, 250 tons, Columbia Basin project, to Colorado Fuel & Iron Co.

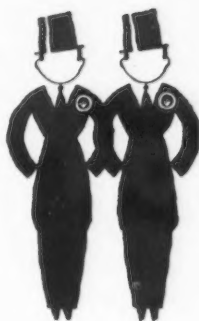
Denver, 245 tons, Columbia Basin project, to Northwest Steel Rolling Mills.

San Francisco, 100 tons, material for Treasury Department under five invitations, to unnamed bidders.

Phoenix, Ariz., 110 tons, building at State Fair grounds, to an unnamed bidder.

Grand Coulee Dam, Wash., 240 tons, to Northwest Steel Rolling Mills.

## In core oil it's "the Tops"



A superintendent in an automotive foundry says of Great Lakes CoroiL: "I have been able to stand among hot transmission cases on our shake-out with no discomfort from irritating gases. We are also reducing the oil in mixes. My requisition went in today for 10 additional drums."

Great Lakes CoroiL is a new and different kind of oil. High strength, fast drying, *lower gas content.*

[Try a drum at our risk! We'll leave it to you—if it isn't a better core binder than you are now using, you pay us nothing.]

### GREAT LAKES FOUNDRY SAND CO.

United Artists Building

Detroit, Michigan

Albuquerque, N. M., 510 tons, State overpass, to Colorado Builders Supply Co.

Pasadena, Cal., 100 tons, El Molino school, to an unnamed bidder.

Los Angeles, 575 tons, Horace Mann school, to Security Materials Co.

Reno, Nev., 255 tons, two State underpasses and bridge, to Soule Steel Co.

#### NEW REINFORCING BAR PROJECTS

Ayer, Mass., 178 tons, bridge.

Mansfield, Ohio, 220 tons, warehouse for Westinghouse Electric & Mfg. Co.

Bureau County, Ill., 200 tons, bridge; Otto Randolph low bidder.

Lake County, Ind., 400 tons, bridges; low bidders announced.

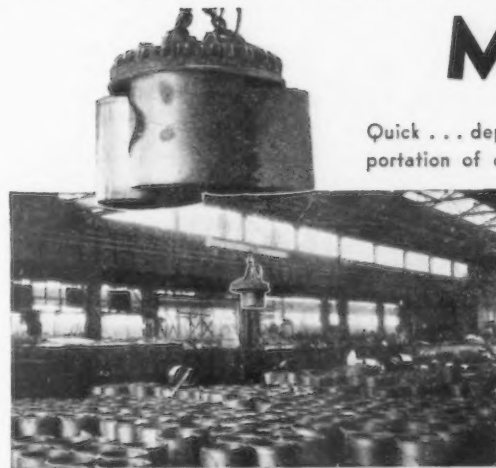
Chicago, 250 tons, Outer Drive; W. E. O'Neill Construction Co., low bidder.

Sacramento, Cal., 100 tons, State overhead crossing at Jibboom Street; bids May 27.

El Monte, Cal., 355 tons, State bridge across Rio Hondo; bids May 28.

Wickenburg, Ariz., 100 tons, State underpass; bids May 22.

## EC&M COIL HANDLING MAGNETS



Quick . . . dependable . . . safe and economical transportation of coils of strip steel is made possible by EC&M Coil Handling Magnets.

A quick drop of the magnet and one, two or three coils are selected from the storage floor. With this method of operation, coils may be stacked closely together without space between. They can be handled equally as well on their sides as on edge; and whether they are hot or cold. Put your coil handling problems up to EC&M.

**The ELECTRIC CONTROLLER**  
**and MFG. CO., CLEVELAND, OHIO**

**AUTOMATIC CONTROL for CRANES • MILL DRIVES and MACHINERY**  
**BRAKES • LIMIT STOPS and LIFTING MAGNETS.**





*... Finished steel demand declines sharply.*

o o o

*... Railroads and container makers are most active customers.*

o o o

*... Prices are firm with talk of third quarter advances not taken seriously.*

**N**EW YORK, May 12.—Demand for finished steel products in the metropolitan area has fallen off rather sharply in the last week. Of the major consuming groups, only the railroads and the container makers are still taking out steel in undiminished volume. Much tonnage is still going into construction, but small miscellaneous lots predominate and large new projects are lacking.

Railroad purchases of rails and track accessories seem to be at an end unless a secondary buying

movement sets in later in the year. This is considered unlikely, particularly in the East. Releases against old orders, however, are in good volume.

The car builders distributed steel last week for the Erie freight cars and early action is expected on the Nickel Plate orders. The Norfolk & Western has issued inquiries to the car builders for 1000 hopper cars and may build the same number in its own shops. The Southern Pacific has entered the market for 2800 freight cars and the Missouri Pacific will

definitely buy 2000 cars. The New York Central is said to be arranging for the financing of a large car order and will definitely buy locomotives. Bids were opened yesterday by the Pere Marquette and the Chesapeake & Ohio on 6100 freight cars. Business of this kind before the trade is thus the largest since 1930.

Tin plate specifications are of a routine character, but the week-to-week volume bulks large. Plate for beer cans does not seem to be so much of a factor in this territory as in the Middle West, but shipments to makers of oil cans are heavy. Tin plate releases are now running ahead of production, but mill stocks have been abnormally large for several months.

Prices on finished steel are being generally maintained and consumer pressure for unearned quantity deductions has subsided somewhat. The character of orders has been changed slightly by the new set-up, with the average size considerably higher. Reports of higher prices for third quarter are generally discounted in this territory, the opinion being that only a forced increase in wage rates could bring about such an eventuality.

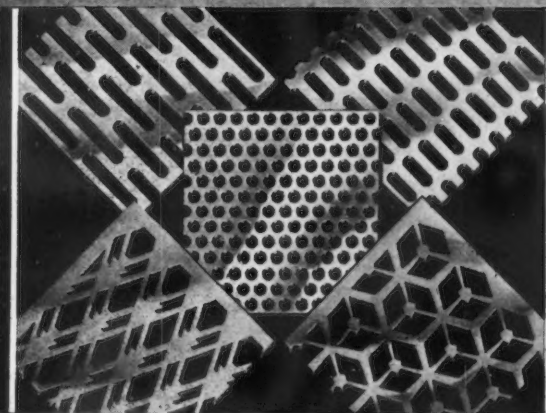
#### **Pig Iron**

Sellers faced an unusually quiet market last week, and only occasional carload quantities were taken. The foundrymen's convention at Detroit possibly served to divert buying interest to some extent, although the chief difficulty, as heretofore, was the absence of an incentive to purchase. Some sellers report that order books are growing thin as shipments have consistently exceeded orders for quite some time. The remainder of the current quarter does not augur well for additional buying, although when third quarter books are opened a different story may be recorded.

#### **Reinforcing Steel**

The market for reinforcing steel went through a quiet period last week, as a number of jobs did not materialize as expected. The board walk at Long Beach, N. Y., which will take 750 tons, is not yet a settled issue, but Joseph T. Ryerson & Son, Inc., is reported low. In Newark, N. J., approximately 340 tons is involved in a building for the Pittsburgh Plate Glass Co., which will be readvertised. Both bars and mesh will be required to satisfy the needs of the Belleville highway project in New Jersey, as, in addition to improving the roadbed, two grade eliminations are contemplated. Several hundred tons in all will be required.

## **PERFORATED METALS**



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**ANY METAL ANY PERFORATION**

**INDUSTRIAL**—Whether your screening problems include very coarse or extremely fine materials, you will obtain the best results with perforated metal. H & K screens have increasingly served in all fields of industry for many years and established an unequalled standard in lasting performance. Regardless of size, metal or perforation, permit us to discuss your requirements with you.

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**PERFORATING CO.**

5657 FILLMORE ST., CHICAGO

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### ... Missouri Pacific to buy 2000 freight cars.

### ... Demand for wire products continues good.

ST. LOUIS, May 12.—The Missouri Pacific has been authorized to expend \$4,295,000 for 1500 50-ton box cars and 500 55-ton coal cars to cost \$2,500 and \$2,350 each respectively, on the 10-year equipment trust plan.

Business in finished iron and steel continues brisk, especially in wire products, with a slight tapering off in the demand for sheets for roofing. The demand for sheets for the stove trade continues good.

The smaller fabricators of structurals report business better. Fabricators of plates for the oil and chemical trades are busy. The prices on sheets have firmed up considerably. Customers are complaining of slow deliveries by mills. Orders for structurals for State highway bridge projects are being held up through "red tape," it is stated.

Shipments of pig iron continue at the same good rate as has prevailed for several weeks past. However, orders were light last week, both sellers and buyers having been at the convention of the American Foundrymen's Association. Stove plants in the Belleville district are in heavy production on orders for June delivery.



### ... Sheet demand begins to taper off.

### ... Ingot output declines.

CINCINNATI, May 12.—Tapering of automobile business is reflected in decreased specifications for finished sheets. New business last week receded to about 75 per cent of capacity, largely as the result of lessened motor car purchases. General demand, particularly from household appliance

manufacturers, remains encouragingly good, while stove makers are steadily in the market. Some fabricators also are cleaning up current inventories before taking new commitments. Average rolling mill operations last week were at 80 per cent, but advance schedules for this week indicate a lower rate, probably between 70 and 75 per cent.

Steel making activity has eased about eight per cent to 77 per cent, two separate interests having taken off one open-hearth each. Need for repairs was the cause of reduction and furnace operators indicate that these units will be refired after repairs have been completed.

The local pig iron market is quiet and featureless. Current ordering is for routine needs, melters showing no interest in maintaining inventories. Shipments against contracts are slower than in the first quarter. Foundries maintain the melt near 70 per cent as demand for castings is sustained. Stove and machine tool melters are near the lead in operations, although jobbers report fair business.



### ... April steel production in Britain sets record.

### ... Pig iron makers still being pushed.

LONDON, May 11.—United Kingdom pig iron output is running at an extraordinarily high rate, but production is being promptly absorbed and works are well booked. Higher prices are expected eventually. Tees, once a large pig iron exporter now is importing Indian iron. Export business is almost dead but there was a shipment of 1000 tons of hematite to the United States.

Additional imports from abroad are relieving the shortage in domestic supplies of semi-finished steel, but demand is strong and new plants are being undertaken.

Heavy domestic demand is evident from ship builders, railroads and structural fabricators but the export trade is dull affecting particularly sheet mills which need orders. The Clyde ship yards have orders totaling 400,000 tons.

Before the Iron and Steel Institute the War Minister has ap-

pealed for the steel industry's cooperation in Britain's rearmament.

April raw steel output set an all-time record of 991,500 tons.

The Continental steel position is less satisfactory and works are experiencing difficulty in maintaining operations at the previous rate. Russia has bought 4000 tons of flat billets and the Far East has bought semi-finished bars. Demand for ship plates is good.

The tin plate market is more quiet, but makers are not anxious to raise output above 60 per cent.



## Again Gould leads the Parade WITH EXTRA VALUES

AGAIN Gould pioneers with the new Type KHD Armored Kathanode battery... giving extra capacity, extra dependability, extra long life, and extra economy.

Increased plate area gives the new Type KHD cell a conservative ampere hour rating 47% greater than the standard size. The ability of this battery to handle full capacity loads after years of service, with new battery performance, is explained by the five major exclusive features of Gould Armored Kathanode construction:

- (1) GlassKlad spun glass retainer mats.
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- All combine to bring you amazing extra performance. Think what the increased capacity and advanced construction of the new Type KHD cells will mean on those tough jobs which are draining your present batteries to the danger point.

Send for the new Gould Battery Manual. It gives valuable information to help you increase battery efficiency and save money. Included are complete data on capacities, discharge rates, construction details, and latest methods of operation and maintenance. Mail the coupon NOW.

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Please send me free copy of your latest battery manual, No. 964, on the new Kathanode battery.	
Name .....	
Address .....	





*... Steel production is slightly lower.*

o o

*... New England industrial situation still strong.*

**B**OSTON, May 12.—The Phillipsdale, R. I., mill is operating two of its three furnaces, the third being down for repairs. Mill operations at Bridgeport, Conn., and Worcester, Mass., are holding up well, but may begin to taper off the last of this month.

The New England foundry melt, if anything, is down slightly, although the machine tool industry is still going fairly well. Orders for electrical appliances are not coming in as rapidly as heretofore, but plants have good backlogs. A few allied steel industries in Connecticut are increasing plant facilities. Shoe factories are increasing production; cotton mills are doing a shade better; woolen mills are still running strong. Collectively, New England's industrial situation is still healthy.

Pig iron sales dropped off somewhat the past week, aggregating not much more than 1000 tons. For some time foundries, except in very

rare instances, have not sent out general inquiries, consequently furnace bookings have been the result of representative's personal solicitation. Such action by foundries is an indication of uncertainty and caution, despite suggestions of possibly higher pig iron costs.

One large project is in the making, but current cast iron pipe buying is very largely in small tonnages for which there is little or no competition among foundries. The local plant of the Warren Foundry & Pipe Corp. reports free shipping instructions and a comfortable backlog of business.



*... Pig iron and steel production maintained.*

o o

*... New construction work developing*

**B**IRMINGHAM, May 12.—New steel tonnage continues to develop at a satisfactory rate, with plates, bars and structural shapes providing most of the current business. A considerable volume of building steel, pending for months, is now being released as construc-

tion work swings into its summer stride.

The pig iron market is still sluggish on account of stocks accumulated by foundries during the last quarter. An improvement is looked for next month.

Steel and iron production is maintaining a steady rate, with 12 blast furnaces and 15 open-hearths in operation. Since December pig iron production has been the highest since the first half of 1931 and by July will probably exceed that period. Steel production the past three months has also been the largest since the early part of 1930.

Nashville Bridge Co. has booked 100 tons of structural steel for the Pierre Part Bay Bridge in Louisiana; Chattanooga Boiler & Tank Co., Chattanooga, Tenn., is low bidder for a 200,000 gal. tank at Dickson, Tenn.; Stewart Iron Works Co., Cincinnati, is low bidder for the steel jail equipment for the new Davidson county jail at Nashville, Tenn.

Ingalls Iron Works Co. delivered a steel barge to the TVA last week from its Decatur, Ala., plant, and also started work on four barges for the War Department, which are to be delivered to Pittsburgh.

Pressure pipe shipments are ahead of April, due to releases of old orders. New business is light.

Freight rates on pig iron from Birmingham to Arkansas, Kansas, Oklahoma and Texas have been reduced from \$2 to \$3 a ton, according to an announcement last week.

*This complete*

## PUMPING UNIT



can supply Coolant on machines not originally equipped with a Pump nor reservoir. Merely a distributing and a return line need be provided to make the installation. . . . Available for any current characteristics . . . power circuit or light socket plug-in. Heavy duty casters are optional on tank.

Switch to "GUSHER" Pumps, and watch your pumping costs drop and your production increase.

*Write for full data*

**THE RUTHMAN MACHINERY COMPANY**

**537 East Front St., Cincinnati, Ohio**

## Urges Selling Backed By Authoritative Facts

**O**SCAR E. HARDER, assistant director, Battelle Memorial Institute, Columbus, Ohio, was the principal speaker at a banquet held by the Northern Ohio chapter of the Gray Iron Founders Society, Inc., at Hotel Cleveland, Cleveland, April 28. Dr. Harder, whose subject was "Research by Industrial Societies and Groups," stressed the importance of constructive research conducted by impartial agents that may be carried on by societies such as the Gray Iron Founders Society, where individual effort would be out of the question. He referred to offensive and defensive methods being employed by competitive materials and urged "selling" backed by authoritative facts where the competitor is merely "merchandising."

W. W. Rose, executive vice-president of the society, spoke briefly on the aims of the society for the future.



# PHILADELPHIA



... Operating rate unchanged at 45 per cent.

o o o

... Reduced open-hearth activity probable.

o o o

... New business lags, but prices are steady.

PHILADELPHIA, May 12.—Market conditions in this district are dull. Mill shipments on old orders are going forward on schedule, but new business to maintain rolling backlogs is not coming in as rapidly as sellers had anticipated. Light-rolled products to miscellaneous outlets constitute the major activity of district sellers. Shipyards are not ordering plates in any volume and railroad buying is almost nil. Moderate tonnage of structural shapes are going into bridge and school construction, but little private work is coming out to take the place of public-works projects.

Central Iron & Steel Co. has taken off one open-hearth and is now operating four units. The largest district producer reports slight advances in output, but it is probable that Steelton, Pa., operations will ease off over the next month. Furthermore, several small mills in this area are now stocking semi-finished steel at a moderate pace, and, unless sales improve, this situation will be reflected in declines in operations over the next month. The average district rate for this week is unchanged at 45 per cent of capacity.

Steel pipe sales in this territory are in fair volume and prices are fairly firm in most instances. The largest award last week involved 250 tons of thick-wall, 10 in. to 16 in. pipe bought by the State of Pennsylvania for dewatering mines in the Pittston area, which went to Jones & Laughlin Steel Corp.

## Pig Iron

Orders are being placed in fair volume at firm price levels. However, there is little snap to the market. With numerous sellers offering iron, day-to-day business is

necessarily spread pretty thin. Although aggregate foundry melt continues at a comparatively high rate, there has lately been a tendency for operations to ease off slightly.

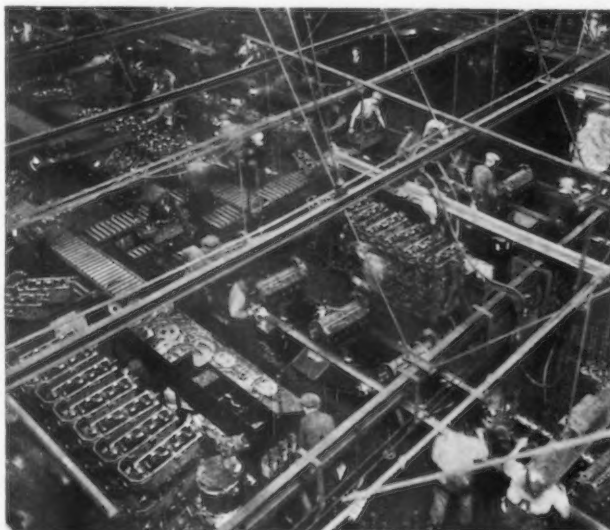
## Plates and Shapes

New business in plates is particularly discouraging, but prices

are holding steady notwithstanding. Shipyards have placed only a small amount of tonnage during the week and no orders have been forthcoming from railroads. Tank work continues to lag. The shape market is more active, although total tonnage involved is not impressive for this time of the year. Fabricating prices on several recent projects have shown a tendency to ease somewhat. Bids go in today for a Federal building at Lewisburg, Pa., requiring 320 tons of shapes, and tenders are due May 19 for a Philadelphia school which will take an estimated 2000 tons. McCloskey & Co. will build the vocational school at Ninth and Mifflin Streets, and it is likely that Fort Pitt Bridge Works will fabricate the 5300 tons of shapes required.

## Reinforcing Steel

Reinforcing bars are moving freely on old orders, but replacement business is coming in very slowly. No sizable tonnage was placed during the week. However, two very large projects are pending—1700 tons for a Philadelphia school and 6500 tons for a building at Washington—and awards during the coming week are antici-



## Man Handling IS TOO EXPENSIVE

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**MATHEWS CONVEYER COMPANY**  
San Francisco, Calif. ELLWOOD CITY, PENNA. Port Hope, Ont., Can.

pated. Bar prices show no weakness, but slight shading has been done in several instances for special jobs.

#### **Sheets**

Distributors report a sizable turnover of terne plate. Blue annealed and hot-rolled sheets are not very active, but cold-rolled grades are still going to radio makers and autobody stamping plants in moderate volume. In aggregate, May bookings to date are about on a par with those for last month. Most sellers expect consumer demands to ease off somewhat over the next six weeks, but business today is following an unprecedented pattern and the usual spring lull may not be as definite as it has been in past years. The Budd company will place over 500 tons of stainless steel strip during the next seven days. The same company may receive another Chevrolet frame order, and, if so, would be a purchaser of a sizable quantity of narrow, heavy-gage strip. All prices are holding firm to established price levels, but this firmness has not yet received a worth-while test on attractive business.

#### **Imports**

The following iron and steel imports were received here last week: 1510 tons of pig iron from the Netherlands; 750 tons of ferromanganese from Russia; 500 tons of chrome ore from British South Africa; 168 tons of steel bars, 57 tons of steel bands, 85 tons of structural shapes and 2 tons of diamond plates from Bel-

gium; 60 tons of CDS wire, 58 tons of steel bars, 82 tons of steel tubes, 19 tons of steel forgings and 10 tons of steel billets from Sweden, and 30 tons of structural shapes from France.



**... Bids soon on 25,000 tons for Shell pipe lines.**

o o o

**... Vancouver bridge will take 11,000 tons.**

**S**AN FRANCISCO, May 12.—Contrary to previous reports that the Shell Oil Co. would open bids in June on a 304-mile pipe line from Bakersfield to Martinez, Cal., bids will be received in Los Angeles within a week or 10 days at the latest. From 6 to 12-in. seamless or electric-welded pipe is specified and 25,000 tons will be involved. Construction and material costs are estimated at \$4,500,000.

Plans and specifications are being completed at Vancouver, B. C., for the \$6,000,000 Narrows bridge which will have a center span of 1500 ft. and 575-ft. side spans. The 11,000 tons of steel required will undoubtedly be British made.

Topping the past week's lettings was the award of 1200 tons of

plates to Consolidated Steel Corp. for three tanks for the Texas Co. at Los Angeles. Bar placements of 483, 510, 575, 426, 506 and 128 tons were made with Northwest Steel Rolling Mills, Colorado Builders Supply Co., Security Materials Co., Soule Steel Co., Colorado Fuel & Iron Co. and Blue Diamond Corp. respectively. Bethlehem Steel Co. took 407 tons of structural steel for underpasses at Reno, Nev., while Pacific Iron & Steel Co. will furnish 280 tons of shapes for the Horace Mann school at Los Angeles.

## **Changes in Republic Advertising Personnel**

STANLEY A. KNISELY, who has been manager of the advertising and sales promotion division, Republic Steel Corp., has been appointed director of advertising with direct supervision of all advertising of the corporation and its subsidiaries. FORREST H. RAMAGE, who has been assistant manager of the advertising and sales promotion division, has been named sales promotion manager in charge of sales



**S. A. KNISELY**

promotion activities which will be a part of the new product development division headed by JULIUS KAHN, who recently resigned as president of the Truscon Steel Co. to become vice-president of the Republic corporation in charge of product development. CHESTER W. RUTH has been made assistant director of advertising. WALTER F. SCHULTZ, formerly chief mechanical engineer of Truscon, has been made chief engineer of the product development division.

The Great Lakes Stamping Co., Toledo, has acquired the former Jeannin Electric Co. plant on Fasset St. and will expand its operations.

Allegheny Steel Co. reopened its downtown office in Cleveland at 1621 Euclid Avenue on May 1.

## **TRIPLE COMPRESSION SCRAP BALERS**



**STYLE  
100 TC**  
(100 x 51 x 36)  
and other sizes

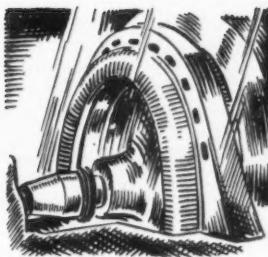
Also Regular  
**Double  
Ram Presses**  
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**GALLAND-HENNING**  
MANUFACTURING COMPANY

2724 S. 31st Street Milwaukee, Wisconsin

COMPLETE LINE OF BALERS: Electric and Hydraulic, also HYDRAULIC PRESSES AND PUMPS



## NON-FERROUS

... Demand for export copper moderates; domestic market dull.

... Zinc shipments increase 4000 tons in April.

... Discount on futures stimulates more interest in tin.

NEW YORK, May 12.—The current lull in copper buying is the result of recent extraordinary purchases. Fresh business has sagged noticeably, but routine orders from company-owned fabricators are coming in daily, and May sales through last week totaled 5462 tons. The week itself accounted for 4252 tons, or an average of about 709 tons daily. While export metal is not currently as active as early last week, a fair demand is reported, with prices ranging from 9.10c. to 9.17½c. a lb., c.i.f., European base ports.

### Tin

The tin market is more active, and some interest in futures has been displayed by tin plate producers. The significant aspect at present appears to be the scarcity of spot and nearby supplies. Although May statistics revealed deliveries of sizable proportions, dealers point out that these were largely sold out in advance. Accordingly spot quotations are at quite a premium over futures, amounting to as much as 2c. a lb. in the case of September metal. Lower quotations on forward positions also may have been the principal stimulus in awakening a bit more interest in anticipated requirements on the part of tin plate interests. Today's spot quotation on Straits metal at New York is 47.00c. a lb., while the price for standard tin in London this morning was £204. Futures were £197 10s. The Eastern price was £202 10s.

### Lead

Buying has slowed down since two weeks ago, but the market remains moderately active. The largest users are now thought to have completed May coverage, though approximately 30 per cent of the

month has still to be secured. June is 40 per cent sold, and accordingly should attract considerably more buying in the immediate future. Pig lead is steady at 4.60c. a lb.,

### Zinc

Shipments of zinc in April totaled 42,311 tons, an increase of

4152 tons over March, according to the American Zinc Institute. Production was 43,252 tons, a gain of 769 tons. Stocks rose 941 tons to 80,782 tons at the period's close. These figures, however, cover all grades of the metal. With respect to Prime Western brand, stocks were decreased by more than 2000 tons. The figures were good, but evidently have caused buyers no apprehension. As heretofore, the difficulty with the zinc market is the unfavorable foreign price which is an effective safeguard against any move by domestic interests to advance quotations on purely technical grounds.

### Non-Ferrous Averages

The average prices for major non-ferrous metals for April based on daily quotations in THE IRON AGE, are as follows:

	Average
Electrolytic copper, Conn.†...	9.394c. a lb.
Lake copper, Eastern delivery	9.519c. a lb.
Straits tin, spot, N. Y.	46.968c. a lb.
Zinc, East St. Louis	4.900c. a lb.
Zinc, New York	5.275c. a lb.
Lead, St. Louis	4.450c. a lb.
Lead, New York	4.600c. a lb.

†Price ¼c. lower in New York.

### The Week's Prices. Cents Per Pound for Early Delivery

	May 6	May 7	May 8	May 9	May 11	May 12
Electrolytic copper, Conn.*	9.50	9.50	9.50	9.50	9.50	9.50
Lake copper, N. Y.	9.62½	9.62½	9.62½	9.62½	9.62½	9.62½
Straits tin, Spot, New York	46.70	46.60	46.62½		46.70	47.00
Zinc, East St. Louis	4.90	4.90	4.90	4.90	4.90	4.90
Zinc, New York†	5.27½	5.27½	5.27½	5.27½	5.27½	5.27½
Lead, St. Louis	4.45	4.45	4.45	4.45	4.45	4.45
Lead, New York	4.60	4.60	4.60	4.60	4.60	4.60

\*Delivered Connecticut Valley; price ¼c. lower delivered in New York.

†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.00c.-21.00c. a lb., delivered.  
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 17.00c. lb., delivered.  
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.  
Antimony, Asiatic, 13.50c. a lb., New York.  
Quicksilver, \$76.50 to \$77.50 per flask.  
Brass ingots, commercial 85-5-5-5, 9.25c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

### From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	47.75c. to 48.75c.
Tin, bar	49.75c. to 50.75c.
Copper, Lake	10.25c. to 11.25c.
Copper, electrolytic	10.25c. to 11.25c.
Copper, castings	10.00c. to 11.00c.
*Copper sheets, hot-rolled	17.00c.
*High brass sheets	15.12½c.
*Seamless brass tubes	17.37½c.
*Seamless copper tubes	17.50c.
*Brass rods	13.12½c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	5.10c. to 6.10c.
Lead, bar	6.10c. to 7.10c.
Lead, Sheets, cut	8.25c.
Antimony, Asiatic	14.00c. to 15.00c.
Alum., virgin, 99 per cent plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.50c. to 20.00c.
Solder, ½ and ⅓	29.50c. to 30.50c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

\*These prices are also for delivery from Chicago and Cleveland warehouses.

### From Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	51.00c.
Tin, bar	53.00c.

Copper, Lake	10.25c. to 10.50c.
Copper, electrolytic	10.25c. to 10.50c.
Copper, castings	10.00c. to 10.25c.
Zinc, slabs	6.50c. to 6.75c.
Lead, American pig	5.20c. to 6.50c.
Lead, bar	8.50c.
Antimony, Asiatic	15.00c.
Babbitt metal, medium grade	19.00c.
Babbitt metal, high grade	55.00c.
Solder, ½ and ⅓	27.50c.

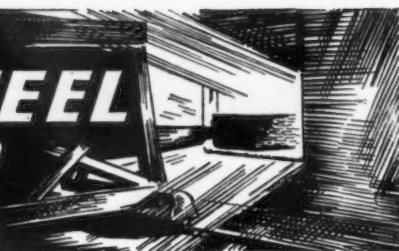
### Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.37½c.	8.12½c.
Copper, hvy. and wire	7.25c.	7.75c.
Copper, light and bottoms	6.25c.	6.75c.
Brass, heavy	4.12½c.	4.75c.
Brass, light	3.37½c.	4.12½c.
Hvy. machine composition	6.12½c.	6.62½c.
No. 1 yel. brass turnings	5.12½c.	5.62½c.
No. 1 red brass or compos. turnings	5.75c.	6.25c.
Lead, heavy	3.62½c.	4.00c.
Sheet aluminum	13.25c.	14.75c.
Zinc	2.50c.	2.87½c.
Cast aluminum	12.12½c.	13.25c.



# IRON AND STEEL SCRAP



**... Composite again declines; is down 41c. to \$13.42.**

• • •

**... Additional fractional reductions likely, although important markets show signs of steadying.**

• • •

**... Mill buying is nil.**

**M**AY 12.—Small dealers are somewhat panicky and are throwing supplies on the market in every district. Combined with this situation, mills are refusing to enter new orders, and the natural result is declining prices all over the country. Eastern Pennsylvania and Chicago are off 50c., dropping the composite down to \$13.42, which is \$1.33 under the peak level maintained between Feb. 25 and March 31. Pittsburgh is untested and unchanged, however, current weakness probably soon will be reflected in quotations.

Although the country's scrap markets are still confused and unsteady, there are signs that drastic declines are over. Eastern Pennsylvania and Chicago are both rallying and additional buying in Pittsburgh is anticipated. Sizable quantities of scrap are yet to leave the country on old export orders, and high mill operations will force certain domestic mills to buy before the month's end.

## Pittsburgh

Buyers are still conspicuous by their absence, the only notable change in the past week being a lifting of an embargo on shipments by one large consumer. However, this plant is limiting incoming shipments. Other consumers are insistent upon receiving only scrap of the highest quality. Meanwhile, the recent \$15 price on No. 1 steel is holding, although the market is showing signs of further weakness. Some dealers are able to pick up small lots at around \$14. Specialties, although firm over the past

two months, have declined in sympathy with the recent drop in steel.

## Chicago

Prices again are easier. Heavy melting steel has sold to a consumer at \$13 a ton, delivered. Whether or not the bottom has been reached is a moot question, but there are two factors which should tend to stiffen the market. Consumption is still very high and promises to remain so for some weeks to come, and prices have now reached the point where it is no longer possible to draw by rail from long distances.

## Philadelphia

Market activity here is typical of a weakening price structure. Buyers are refusing to purchase until a low point is reached and sellers, particularly small dealers, are throwing supplies on the market in somewhat of a panic. The severe price reaction of the past few days comes as a surprise to most observers. Some easiness was anticipated, but sustained mill activity should be a greater stabilizing factor than it has been. No. 1 steel here is nominally quoted at \$12.50 to \$13 in the absence of definite test sales. Export brokers are buying the same grade for as low as \$11.50 at Port Richmond. A boat is due today to load 1500 tons for Japan, and several other boats will take additional tonnages before the month's end. Brokers owe considerable scrap to Japan and England, and both of these countries are still interested in new commitments.

## Cleveland

A Youngstown mill has bought a small tonnage of No. 2 steel at \$13.50.

Local prices again have declined 50c. a ton on both steel making and blast furnace grades and the market continues weak. Supplies are more plentiful, which is in part due to water shipments from Detroit. Deliveries are being regulated by mills in the Valley district. The New York Central and Erie railroads sold none of the scrap for which they received bids last week, being unwilling to let accumulations go at the prices offered.

## New York

Brokers are taking advantage of weakness in domestic price levels to cover outstanding export commitments at lower prices. Bids for No. 1 and No. 2 are down 50c. to \$9.50 and \$8.50 respectively. Cast grades also are lower and specialties are for the most part untested and unchanged. Reports that Italy has retired from the market are misleading inasmuch as Italy has not been an active buyer for many months. Japan and England are naturally refusing to purchase on a declining market, but there is every possibility that new orders will be placed over the next few weeks. Brokers here are currently loading barges for export and are shipping against old orders into eastern Pennsylvania. General sentiment is that weakness in prices will soon disappear.

## Boston

Export prices for large tonnages of Nos. 1 and 2 steels are down to \$11 and \$10 respectively and about 25c. lower for single car lots. Buying, even at the reduced prices, is slow. One of the largest exporters, with about two score cars left over from his previous shipment, says prospects for additional exports are not bright due to developments abroad. A small boat finished loading 1700 tons for Scotland at Providence, R. I., on May 11, and will pick up an additional 1000 tons at Norfolk. No new domestic business is reported.

## Buffalo

The leading district consumer again has cut its offering price for No. 1 steel and similar grades. This buyer is willing to pay \$12.50 to \$13 for No. 1, and No. 2 steel and compressed bundles cannot bring over \$11 to \$11.50. Other mills are not showing much interest in buying at this time, and the market is definitely softer.

## St. Louis

Further price recessions are noted, resulting mostly from the lack of mill buying. Selected heavy steel and railroad springs are 50c. lower, and Nos. 1 and 2 steels, miscellaneous standard section rails, and No. 2 railroad wrought, are all off 25c. New mill buying is expected next week.

## Detroit

This market shows further weakening, particularly in machine shop turnings and compressed sheets. Automotive cast is \$1 lower. Supplies are coming out of automobile plants in great quantities, but there are few buyers under present market conditions.

# Iron and Steel Scrap Prices

## PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
No. 2 hvy. mltng. steel.	13.00 to 13.50
No. 2 RR. wrought.	14.50 to 15.00
Scrap rails	15.00 to 15.50
Rails, 3 ft. and under.	16.50 to 17.00
Comp. sheet steel	14.50 to 15.00
Hand bundled sheets.	13.50 to 14.00
Hvy. steel axle turn.	13.00 to 13.50
Machine shop turn.	9.75 to 10.25
Short shov. turn.	10.00 to 10.50
Mixed bor. turn.	8.25 to 9.25
Cast iron borings.	10.00 to 10.50
Cast iron carwheels.	14.00 to 14.50
Hvy. breakable cast.	13.00 to 13.50
No. 1 cast	15.00 to 15.50
RR. knuckles & cplrs.	17.00 to 17.50
Rail, coil & leaf springs	17.00 to 17.50
Rolled steel wheels.	17.00 to 17.50
Low phos. billet crops.	17.50 to 18.00
Low phos. sh. bar.	17.00 to 17.50
Low phos. punchings.	16.75 to 17.25
Low phos. plate scrap.	16.75 to 17.25
Steel car axles	16.00 to 16.50

## CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 hvy. mltng. steel.	\$13.25 to \$13.75
No. 2 hvy. mltng. steel.	12.00 to 12.50
Comp. sheet steel	12.50 to 13.00
Light bund. stampings	9.00 to 9.50
Drop forge flashings.	12.00 to 12.50
Machine shop turn.	7.50 to 8.00
Short shov. turn.	8.00 to 8.50
No. 1 busheling	12.50 to 13.00
Steel axle turnings.	12.50 to 12.50
Low phos. billet crops	17.00 to 17.50
Cast iron borings.	8.00 to 8.50
Mixed bor. & turn.	8.00 to 8.50
No. 2 busheling	8.00 to 8.50
No. 1 cast	14.50 to 15.00
Railroad grate bars.	8.00 to 8.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	17.00 to 17.50
Rails for rolling	16.50 to 17.00
Railroad malleable	17.00 to 17.50
Cast iron carwheels.	15.50

## PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 hvy. mltng. steel.	\$12.50 to \$13.00
No. 2 hvy. mltng. steel.	11.50 to 12.00
Hydraulic bund., new.	13.00 to 13.50
Hydraulic bund., old.	10.50 to 11.00
Steel rails for rolling.	15.00 to 15.50
Cast iron carwheels.	13.50 to 14.00
Hvy. breakable cast.	13.00 to 13.50
No. 1 cast	13.50 to 14.00
Stove plate (steel wks)	11.50 to 12.00
Railroad malleable	17.50 to 18.00
Machine shop turn.	8.00 to 8.50
No. 1 blast furnace.	6.25
Cast borings	6.00
Heavy axle turnings.	11.50 to 12.00
No. 1 low phos. hvy.	16.00 to 16.50
Couplers & knuckles.	16.00 to 16.50
Rolled steel wheels.	16.00 to 16.50
Steel axles	16.00 to 16.50
Shafting	18.50 to 19.00
No. 1 RR. wrought.	14.50 to 15.00
Spec. iron & steel pipe	12.00 to 12.50
Bundled sheets	11.00 to 11.50
No. 1 forge fire	13.00 to 13.50
Cast borings (chem.)	10.50 to 13.00

## CHICAGO

Delivered Chicago district consumers:

Per Gross Ton	
Hvy. mltng. steel.	\$12.50 to \$13.00
Auto. hvy. mltng. steel	11.00 to 11.50
Shoveling steel	12.50 to 13.00
Hydraul. comp. sheets.	11.50 to 12.00
Drop forge flashings.	12.00 to 12.50
No. 1 busheling	12.25 to 12.75
Rolled carwheels	14.50 to 15.00
Railroad tires cut	14.50 to 15.00
Railroad leaf springs.	14.50 to 15.00
Axle turnings	12.50 to 13.00
Steel coup. & knuckles	14.50 to 15.00
Coil springs	15.00 to 15.50
Axle turn. (elec.)	13.25 to 13.75
Low phos. punchings.	15.00 to 15.50
Low phos. plates, 12 in. and under	15.50 to 16.00
Cast iron borings	6.00 to 6.50
Short shov. turnings.	6.25 to 6.75
Machine shop turn.	6.50 to 7.00
Rerolling rails	14.50 to 15.00
Steel rails under 3 ft.	15.25 to 15.75
Steel rails under 2 ft.	15.75 to 16.25
Angle bars, steel.	15.00 to 15.50
Cast iron carwheels.	14.00 to 14.50
Railroad malleable	16.00 to 16.50
Agric. malleable	14.00 to 14.50
Per Net Ton	
Iron car axles	\$18.00 to \$18.50
Steel car axles	14.25 to 14.75
No. 1 RR. wrought.	12.00 to 12.50
No. 2 RR. wrought.	11.00 to 11.50

No. 2 busheling, old.	\$7.50 to \$8.00
Locomotive tires	12.00 to 12.50
Pipes and flues	8.00 to 8.50
No. 1 machinery cast.	12.00 to 12.50
Clean auto. cast	11.00 to 11.50
No. 1 railroad cast.	11.00 to 11.50
No. 1 agric. cast.	10.00 to 10.50
Stove plate	7.00 to 7.50
Grate bars	8.50 to 9.00
Brake shoes	8.50 to 9.00

## BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mltng. steel.	\$13.00 to \$13.50
No. 2 hvy. mltng. steel.	11.50 to 12.00
Scrap rails	13.00 to 13.50
New hy. b'ndled sheets	11.50 to 12.00
Old hydraul. bundles.	10.50 to 11.00
Drop forge flashings.	11.50 to 12.00
No. 1 busheling	11.50 to 12.00
Hvy. axle turnings.	11.50 to 12.00
Machine shop turn.	7.00
Knuckles & couplers.	15.50 to 16.00
Coil & leaf springs.	15.50 to 16.00
Rolled steel wheels.	15.50 to 16.00
Low phos. billet crops	16.00 to 16.50
Short shov. turnings.	7.75 to 8.25
Mixed bor. & turn.	7.75 to 8.25
Cast iron borings.	7.75 to 8.25
No. 2 bushelings	6.50
Steel car axles	13.50 to 14.00
Iron axles	12.00 to 12.50
No. 1 machinery cast.	13.50 to 14.00
No. 1 cupola cast.	12.50 to 13.00
Stove plate	10.50 to 11.00
Steel rails, under 3 ft.	15.75 to 16.25
Cast iron carwheels.	11.50 to 12.00
Railroad malleable	16.25 to 16.75
Chemical borings	9.00 to 9.50

## BIRMINGHAM

Per gross ton delivered consumers' yards:

Hvy. melting steel.	\$11.00 to \$11.50
Scrap steel rails.	11.50 to 12.00
Short shov. turnings.	7.00
Stove plates	8.00
Steel axles	12.00 to 12.50
Iron axles	12.00 to 12.50
No. 1 RR. wrought.	8.50 to 9.00
Rails for rolling	12.50 to 13.00
No. 1 cast	12.00 to 12.50
Tramcar wheels	11.00 to 12.00

## ST. LOUIS

Dealers' buying prices per gross ton delivered consumers' works:

Selected hvy. steel.	\$12.00 to \$12.50
No. 1 hvy. melting	12.00 to 12.50
No. 2 hvy. melting	10.25 to 10.75
No. 1 locomotive tires.	11.00 to 11.50
Misc. stand-sec. rails.	12.75 to 13.25
Railroad springs	13.50 to 14.00
Bundled sheets	9.50 to 10.00
No. 2 RR. wrought.	12.00 to 12.50
No. 1 busheling	7.50 to 8.00
Cast bor. & turn.	4.50 to 5.00
Rails for rolling	13.75 to 14.25
Machine shop turn.	4.00 to 4.50
Heavy turnings	9.25 to 9.75
Steel car axles	13.00 to 13.50
Iron car axles	15.00 to 16.00
No. 1 RR. wrought.	10.50 to 11.00
Steel rails under 3 ft.	13.50 to 14.00
Steel angle bars	12.75 to 13.25
Cast iron carwheels.	11.00 to 11.50
No. 1 machinery cast.	11.00 to 11.50
Railroad malleable	14.00 to 14.50
No. 1 railroad cast.	11.00 to 11.50
Stove plate	7.50 to 8.00
Agricul. malleable	12.50 to 13.00

## CINCINNATI

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	\$11.00 to \$11.50
No. 2 hvy. mltng. steel.	9.00 to 9.50
Scrap rails for mltng.	10.50 to 11.00
Loose sheet clippings.	6.50 to 7.00
Bundled sheets	7.75 to 8.25
Cast iron borings	5.75 to 6.25
Machine shop turn.	6.50 to 7.00
No. 1 busheling	8.50 to 9.00
No. 2 busheling	4.25 to 4.75
Rails for rolling	11.00 to 11.50
No. 1 locomotive tires	9.50 to 10.00
Short rails	14.00 to 14.50
Cast iron carwheels	10.50 to 11.00
No. 1 machinery cast.	11.50 to 12.00
No. 1 railroad cast.	10.75 to 11.25
Burnt cast	7.75 to 8.25
Stove plates	7.75 to 8.25
Agricul. malleable	9.75 to 10.25
Railroad malleable	11.50 to 12.00

## DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	\$10.00 to \$10.50
No. 2 hvy. mltng. steel.	9.00 to 9.50
Borings and turnings.	6.00 to 6.50
Long turnings	5.75 to 6.25
Short shov. turnings.	6.00 to 6.50
No. 1 machinery cast.	14.50 to 15.00

Automotive cast	\$12.50 to \$13.00
Hydraul. comp. sheets	10.50 to 11.00
Stove plate	8.75 to 9.25
New factory bushel.	9.25 to 9.75
Old No. 2 busheling.	5.25 to 5.75
Sheet clippings	7.75 to 8.25
Flashings	9.00 to 9.50
Low phos. plate scrap.	10.50 to 11.00

## CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Hvy. melting steel.	\$7.50	\$7.00
Rails, scrap	8.50	8.00
Machine shop turn.	4.00	4.00
Boiler plate	7.00	6.00
Hvy. axle turnings.	4.50	4.00
Cast borings	5.00	4.50
Steel borings	4.00	4.00
Wrought pipe	4.00	4.00
Steel axles	8.50	9.00
Axles, wrought iron.	9.00	9.50
No. 1 machinery cast.	11.50	11.00
Stove plate	7.50	7.00
Standard carwheels	11.00	10.50
Malleable	7.00	7.00
Shoveling steel	6.50	6.00
Bushelings	6.00	5.50
Compressed sheets	6.50	6.00

## YOUNGSTOWN

Per gross ton delivered consumers' yards:

No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
Hydraulic bundles	14.50 to 15.00
Machine shop turn.	10.00 to 10.50

## NEW YORK

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	\$9.00 to \$9.50
No. 2 hvy. mltng. steel.	8.00 to 8.50
Hvy. breakable cast.	8.50 to 9.00
No. 1 machinery cast.	9.50 to 10.00
No. 2 cast	8.25 to 8.75
Stove plate	7.25 to 7.50
Steel car axles	13.50 to 14.00
Shafting	14.50 to 14.75
No. 1 RR. wrought.	9.50 to 10.00
No. 1 wrought long.	8.50 to 9.00
Spec. iron & steel pipe	8.50 to 9.00
Forge fire	7.50 to 8.00
Rails for rollings.	11.00 to 12.00
Short shov. turnings.	5.00 to 5.50
Machine shop turn.	4.50 to 5.00
Cast borings	4.50 to 5.00
No. 1 blast furnace.	3.00 to 3.50
Cast borings (chem.)	10.00 to 11.00
Unprepar. yard scrap.	6.25 to 6.75

Per gross ton, delivered local foundries:

No. 1 machin. cast	\$12.00
No. 1 hvy. cast cupola.	10.00
No. 2 cast	8.50

Add 50c. to 75c. to above quotations to secure North Jersey prices.

## BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	\$9.15 to \$9.40
Scrap rails	9.15 to 9.40
No. 2 steel	8.50 to 8.75
Breakable cast	8.00 to 8.25
Machine shop turn.	3.90 to 4.15
Bund. skeleton, long.	7.25 to 7.30
Shafting	13.50 to 13.75
Cast bor., chemical.	5.00 to 7.00
Cotton ties	5.75 to 6.00

Per gross ton delivered consumers' yards:

Textile cast	\$10.50 to \$11.00
No. 1 machin. cast.	10.50 to 11.00
Stove plate	9.00

## EXPORT

Brokers' buying prices per gross ton:

New York, delivered alongside barges	
No. 1 hvy. mltng. steel.	\$9.50
No. 2 hvy. mltng. steel.	8.50
No. 2 cast	\$8.00 to 8.50
Stove plate	7.00 to 7.25
Rails (scrap)	10.50 to 11.00

Philadelphia, on cars at Port Richmond

No. 1 heavy melting steel.....\$11.50

Boston, on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.\$10.75 to \$11.00

No. 2 hvy. mltng. steel. 9.75 to 10.00

Rails (scrap) 11.00

Machine shop turn..... 5.25 to 5.75

Stove plate 7.25 to 7.50

New Orleans, on cars at Stuyvesant Dock

No. 1 hvy. mltng. steel.\$10.50 to \$11.00

No. 2 hvy. mltng. steel. 9.50 to 10.00

Los Angeles, on cars or trucks at local piers

No. 1 hvy. mltng. steel.\$10.25 to \$10.75

Compressed bundles .. 8.50 to 8.75



# PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

## SEMI-FINISHED STEEL

### Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton  
 Rerolling .....\$28.00  
 Forging quality ..... 35.00

### Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton  
 Open-hearth or Bessemer ....\$28.00

### Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.  
 Grooved, universal and sheared 1.80c.

### Wire Rods

(Nos. 4 and 5)

Per Gross Ton  
 F.o.b. Pittsburgh or Cleveland..\$38.00  
 F.o.b. Chicago, Youngstown or Anderson, Ind. .... 39.00  
 F.o.b. Worcester, Mass. .... 40.00  
 F.o.b. Birmingham ..... 41.00  
 F.o.b. San Francisco ..... 47.00  
 F.o.b. Galveston ..... 44.00

## BARS, PLATES, SHAPES

### Iron and Steel Bars

#### Soft Steel

Base per Lb.  
 F.o.b. Pittsburgh .....1.85c.  
 F.o.b. Chicago or Gary.....1.90c.  
 F.o.b. Duluth .....2.00c.  
 Del'd Detroit .....2.00c.  
 F.o.b. Cleveland .....1.90c.  
 F.o.b. Buffalo .....1.95c.  
 Del'd Philadelphia .....2.16c.  
 Del'd New York .....2.20c.  
 F.o.b. Birmingham .....2.00c.  
 F.o.b. cars dock Gulf ports...2.25c.  
 F.o.b. cars dock Pacific ports...2.40c.

#### Rail Steel

(For merchant trade)

F.o.b. Pittsburgh .....1.70c.  
 F.o.b. Cleveland, Chicago, Gary or Moline, Ill. ....1.75c.  
 F.o.b. Buffalo .....1.80c.  
 F.o.b. Birmingham .....1.85c.  
 F.o.b. cars dock Gulf ports...2.10c.  
 F.o.b. cars dock Pacific ports..2.25c.

#### Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh .....2.05c.  
 F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham .....2.10c.  
 Del'd Detroit .....2.20c.  
 F.o.b. cars dock Gulf ports...2.45c.  
 F.o.b. cars dock Pacific ports..2.45c.

#### Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh .....1.90c.  
 F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham .....1.95c.  
 F.o.b. cars dock Gulf ports...2.30c.  
 F.o.b. cars dock Pacific ports..2.30c.

### Iron

F.o.b. Chicago .....1.80c.  
 F.o.b. Pittsburgh (refined)...2.10c.  
 Delivered New York .....2.05c.  
 Delivered Philadelphia .....2.10c.

### Cold Finished Bars and Shafting\*

Base per Lb.  
 F.o.b. Pittsburgh .....2.10c.  
 F.o.b. Cleveland, Chicago and Gary .....2.15c.  
 F.o.b. Buffalo .....2.20c.  
 Del'd Detroit .....2.30c.  
 Del'd eastern Michigan.....2.35c.

\*In quantities of 10,000 to 19,999 lb.

## Plates

### Base per Lb.

F.o.b. Pittsburgh .....1.80c.  
 F.o.b. Chicago or Gary .....1.85c.  
 Del'd Cleveland .....1.995c.  
 F.o.b. Coatesville or Spar. Pt. 1.90c.  
 Del'd Philadelphia .....1.99c.  
 Del'd New York .....2.09c.  
 F.o.b. Birmingham .....1.95c.  
 F.o.b. cars dock Gulf ports...2.20c.  
 F.o.b. cars dock Pacific ports.2.35c.  
 Wrought iron plates, f.o.b. Pittsburgh .....3.20c.

## Floor Plates

F.o.b. Pittsburgh .....3.35c.  
 F.o.b. Chicago .....3.40c.  
 F.o.b. Coatesville .....3.45c.  
 F.o.b. cars dock Gulf ports...3.75c.  
 F.o.b. cars dock Pacific ports..3.90c.

## Structural Shapes

### Base per Lb.

F.o.b. Pittsburgh .....1.80c.  
 F.o.b. Chicago .....1.85c.  
 Del'd Cleveland .....1.995c.  
 F.o.b. Buffalo or Bethlehem...1.90c.  
 Del'd Philadelphia .....2.015c.  
 Del'd New York .....2.0625c.  
 F.o.b. Birmingham (standard) 1.95c.  
 F.o.b. cars dock Gulf ports ...2.20c.  
 F.o.b. cars dock Pacific ports..2.35c.

## Steel Sheet Piling

### Base per Lb.

F.o.b. Pittsburgh .....2.15c.  
 F.o.b. Chicago or Buffalo.....2.25c.  
 F.o.b. cars dock Gulf or Pacific Coast ports .....2.60c.

## RAILS AND TRACK SUPPLIES

### F.o.b. Mill

Standard rails, heavier than 60 lb. per gross ton.....\$36.37½  
 Angle bars, per 100 lb. .... 2.55

### F.o.b. Code Basing Points

Light rails (from billets) per gross ton .....\$35.00  
 Light rails (from rail steel) per gross ton ..... 34.00

### Base per 100 Lb.

Spikes ..... 2.60  
 Tie plates, steel ..... 1.90  
 Tie plates, Pacific Coast ports.. 2.00  
 Track bolts, to steam railroads.. 3.60  
 Track bolts, to jobbers, all sizes (per 100 counts) 70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham on spikes and tie plates. Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Welton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbus, Pa., Richmond, Va.

## SHEETS, STRIP, TIN PLATE,

### TERNE PLATE

#### Sheets

#### Hot Rolled

### Base per Lb.

No. 10, f.o.b. Pittsburgh.....1.85c.  
 No. 10, f.o.b. Gary .....1.95c.  
 No. 10, del'd Detroit .....2.05c.  
 No. 10, del'd Philadelphia .....2.16c.  
 No. 10, f.o.b. Birmingham .....2.00c.  
 No. 10, f.o.b. cars dock Pacific ports .....2.40c.

#### Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh .....2.40c.  
 No. 24, f.o.b. Gary .....2.50c.  
 No. 24, del'd Detroit.....2.45c. to 2.60c.  
 No. 24, del'd Philadelphia .....2.71c.

No. 24, f.o.b. Birmingham.....2.55c.  
 No. 24, f.o.b. cars dock Pacific ports .....3.05c.  
 No. 24, wrought iron, Pittsburgh .....4.30c.

### Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh...2.50c.  
 No. 10 gage, f.o.b. Gary .....2.60c.  
 No. 10 gage, f.o.b. Detroit.....2.70c.  
 No. 10 gage, del'd Philadelphia.2.81c.  
 No. 10 gage, f.o.b. Birmingham.2.65c.  
 No. 10 gage, f.o.b. cars dock Pacific ports .....3.10c.

### Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh..2.95c.  
 No. 20 gage, f.o.b. Gary .....3.05c.  
 No. 20 gage, del'd Detroit.....3.15c.  
 No. 20 gage, del'd Philadelphia.3.26c.  
 No. 20 gage, f.o.b. Birmingham.3.10c.  
 No. 20 f.o.b. cars dock Pacific ports .....3.50c.

### Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh...3.10c.  
 No. 24, f.o.b. Gary .....3.20c.  
 No. 24, del'd Philadelphia .....3.41c.  
 No. 24, f.o.b. Birmingham .....3.25c.  
 No. 24, f.o.b. cars dock Pacific ports .....8.70c.  
 No. 24, wrought iron, Pittsburgh .....4.95c.

### Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh .....3.40c.  
 F.o.b. Gary .....3.50c.  
 F.o.b. cars dock Pacific ports..4.10c.

### Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh .....2.95c.  
 No. 20, f.o.b. Gary .....3.05c.  
 No. 20, f.o.b. Birmingham .....3.55c.  
 No. 20, f.o.b. cars dock Pacific ports .....3.55c.

### Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh .....2.75c.  
 No. 28, Gary .....2.85c.  
 No. 28, cars dock Pacific ports.3.35c.

### Tin Plate

### Base per Box

Standard cokes, f.o.b. Pittsburgh district mill .....\$5.25  
 Standard cokes, f.o.b. Gary..... 5.35  
 Standard cokes, f.o.b. cars dock Pacific ports ..... 5.90

### Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.....\$10.00  
 15-lb. coating I.C..... 12.00  
 20-lb. coating I.C..... 13.00  
 25-lb. coating I.C..... 14.00  
 30-lb. coating I.C..... 15.25  
 40-lb. coating I.C..... 17.50

### Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

### Base per Lb.

All widths up to 24 in., P'gh...1.85c.  
 All widths up to 24 in., Chicago.1.95c.  
 All widths up to 24 in., del'd Detroit .....2.05c.  
 All widths up to 24 in., Birmingham .....2.00c.  
 Cooperage stock, Pittsburgh ..1.95c.  
 Cooperage stock, Chicago .....2.05c.

### Cold-Rolled Strips\*

### Base per Lb.

F.o.b. Pittsburgh .....2.60c.  
 F.o.b. Cleveland .....2.60c.  
 Del'd Chicago .....2.895c.  
 F.o.b. Worcester .....2.80c.

\*Carbon 0.25 and less.

### Fender Stock

No. 14, Pittsburgh or Cleveland.2.90c.  
 No. 14, Worcester .....3.30c.  
 No. 20, Pittsburgh or Cleveland.3.30c.  
 No. 20, Worcester .....3.70c.



## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

### To Manufacturing Trade

	Per Lb.
Bright wire	2.40c.
Spring wire	3.05c.

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

### To the Trade

	Base per Keg
Standard wire nails	\$2.10
Smooth coated nails	2.10

	Base per 100 Lb.
Annealed fence wire	\$2.65
Galvanized fence wire	3.00
Polished staples	2.80
Galvanized staples	3.05
Barbed wire, galvanized	2.60
Twisted barbed wire	2.60
Woven wire fence, base column	58
Single loop bale ties, base column	51

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh; Duluth, Minn., mill prices are \$2 a ton over Pittsburgh except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

## STEEL AND WROUGHT IRON PIPE AND TUBING

### Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld	
Steel	Wrought Iron
In. Black Galv.	In. Black Galv.
1/8 ..... 57 37	1/8 ..... 57 37
1/4 to 3/8 ..... 60 44 1/2	1/4 to 3/8 ..... 60 44 1/2
1/2 ..... 64 55	1/2 ..... 64 55
3/4 ..... 67 59	3/4 ..... 67 59
1 to 3 ..... 69 61 1/2	1 to 3 ..... 69 61 1/2

Lap Weld	
Steel	Wrought Iron
In. Black Galv.	In. Black Galv.
2 ..... 62 53 1/2	2 ..... 62 53 1/2
2 1/2 to 3.65 ..... 66 56 1/2	2 1/2 to 3.65 ..... 66 56 1/2
3 1/2 to 6.67 ..... 68 58 1/2	3 1/2 to 6.67 ..... 68 58 1/2
7 & 8.66 ..... 69 59 1/2	7 & 8.66 ..... 69 59 1/2
9 & 10.65 1/2 ..... 69 59 1/2	9 & 10.65 1/2 ..... 69 59 1/2
11 & 12.64 1/2 ..... 69 59 1/2	11 & 12.64 1/2 ..... 69 59 1/2

Butt Weld, extra strong, plain ends	
Steel	Wrought Iron
In. Black Galv.	In. Black Galv.
1/8 ..... 55 42 1/2	1/8 ..... 55 42 1/2
1/4 to 3/8 ..... 57 44 1/2	1/4 to 3/8 ..... 57 44 1/2
1/2 ..... 62 54 1/2	1/2 ..... 62 54 1/2
3/4 ..... 66 58 1/2	3/4 ..... 66 58 1/2
1 to 3 ..... 68 61	1 to 3 ..... 68 61

Lap Weld, extra strong, plain ends	
Steel	Wrought Iron
In. Black Galv.	In. Black Galv.
2 ..... 60 52 1/2	2 ..... 60 52 1/2
2 1/2 to 3.64 ..... 66 56 1/2	2 1/2 to 3.64 ..... 66 56 1/2
3 1/2 to 6.67 1/2 ..... 68 58 1/2	3 1/2 to 6.67 1/2 ..... 68 58 1/2
7 & 8.66 1/2 ..... 69 59 1/2	7 & 8.66 1/2 ..... 69 59 1/2
9 & 10.65 1/2 ..... 69 59 1/2	9 & 10.65 1/2 ..... 69 59 1/2
11 and 12 64 1/2 ..... 69 59 1/2	11 and 12 64 1/2 ..... 69 59 1/2

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

### Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G. \$ 8.60	\$ 7.82
1 1/4 in. o.d.	13 B.W.G. 10.19	9.26
1 1/2 in. o.d.	13 B.W.G. 11.26	10.23
1 3/4 in. o.d.	13 B.W.G. 12.81	11.64
2 in. o.d.	13 B.W.G. 14.35	13.04
2 1/4 in. o.d.	13 B.W.G. 16.00	14.54
2 1/2 in. o.d.	12 B.W.G. 17.61	16.01
2 3/4 in. o.d.	12 B.W.G. 19.29	17.54
3 in. o.d.	12 B.W.G. 20.45	18.59

3 in. o.d.	12 B.W.G.	21.45	19.50
4 1/2 in. o.d.	10 B.W.G.	41.08	37.35
3 1/2 in. o.d.	11 B.W.G.	27.09	24.62
4 in. o.d.	10 B.W.G.	33.60	30.54
4 1/2 in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.90

### Extra for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12 1/2 %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

## CAST IRON WATER PIPE

### Per Net Ton

*6-in. and larger, del'd Chicago	\$48.40
6-in. and larger, del'd New York	45.20
*6-in. and larger, Birmingham	40.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	48.00
F.o.b. dock, Seattle	48.50
F.o.b. dock, Seattle	51.50
Class "A" and gas pipe, \$3 extra.	
4-in. pipe is \$3 a ton above 6-in.	

\*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$39 Birmingham, and \$47.40 delivered Chicago and 4-in. pipe, \$42 Birmingham, and \$50.40 a ton, delivered Chicago.

## BOLTS, NUTS, RIVETS, SET SCREWS

### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

### Per Cent Off List

Machine and carriage bolts:	
1/2 in. x 6 in. and smaller	70, 10 and 5
Larger than 1/2 in.	70 and 10
Lag bolts	70 and 10
Flow bolts, Nos. 1, 2, 3, and 7	
heads	70 and 10
Hot-pressed nuts, blank or tapped, square	70 and 10
Hot-pressed nuts, blank or tapped, hexagon	70 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	70 and 10
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes	
60, 20 and 15	
Stove bolts in packages, nuts attached	72 1/2, 10 and 10
Stove bolts in packages, with nuts separate	72 1/2, 10, 10 and 5
Stove bolts in bulk	82 1/2
Tire bolts	55

On stove bolts freight is allowed to destination on 200 lb. and over.

### Large Rivets

(1/2-in. and larger)

### Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland	\$2.30
F.o.b. Chicago or Birmingham	3.00

### Small Rivets

(7/16-in. and smaller)

### Per Cent Off List

F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm.	70 and 5

### Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

### Per Cent Off List

Milled cap screws, 1 in. dia. and smaller	80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread 3/4 in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	85
Upset set screws, cut and oval points	75 and 10
Milled studs	65 to 65 and 10

## Alloy and Stainless Steel

### Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, \$49 a gross ton.

### Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton. Open-hearth grade, base ..... 2.45c. Delivered price at Detroit is ..... 2.60c.

## S.A.E. Alloy Series Numbers

	Differential per 100 lb.
2000 (1/2% Nickel)	\$0.25
2100 (2 1/2% Nickel)	0.95
2300 (3 1/2% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel...base	
6100 Chromium Vanadium Bar...1.10c.	
6100 Chromium Vanadium Spring Steel	\$0.70
Chromium Nickel Vanadium	1.40
Carbon Vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars 1/2c. per lb. higher with separate extras. Blooms, billets and slabs under 4 1/2 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

### Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

## STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% NI. 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Bars	23c.
Plates	26c.
Structural shapes	23c.
Sheets	33c.
Hot-rolled strip	20 1/2c.
Cold-rolled strip	27c.
Drawn wire	23c.

## TOOL STEEL

### Base per Lb.

High speed	55c.
High carbon chrome	35c.
Oil hardening	20c.
Extra	15c.
Regular	12c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

## British and Continental

### BRITISH

Per Gross Ton

f.o.b. United Kingdom Ports

Based on exchange rate as of

May 4

Ferromanganese, export	\$44.64
Billets, open-hearth	29.14 to \$30.38
Tin plate, per base box	4.65 to 5.01
Steel bars, open-hearth	39.04
Beams, open-hearth	37.92
Channels, open-hearth	39.04
Angles, open-hearth	37.92
Black sheets, No. 24 gage	48.36
Galvanized sheets, No. 24 gage	58.28

## CONTINENTAL

Per Metric Ton, f.o.b. Continental Ports

Based on exchange rate of

May 4

Billets, Thomas	\$19.22
Wire rods, No. 5 B.W.G.	36.81
Steel bars, merchant	26.58
Sheet bars	19.63
Plate, 1/4 in. and up	35.38
Plate, 3/16 in. and 5 mm.	34.76
Sheets, 1/4 in.	36.81
Beams, Thomas	25.56
Angles (Basic)	25.56
Hoops and strip base	32.71
Wire, plain, No. 8	43.97
Wire nails	47.03
Wire, barbed, 4 pt. No. 10 B.W.G.	70.57

# IRON AND STEEL WAREHOUSE PRICES

## PITTSBURGH

### Base per Lb.

Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.95c.
Reinforcing steel bars	2.95c.
Cold-finished and screw stock:	
Rounds and hexagons	3.35c.
Squares and flats	3.35c.
Hoops and bands under 1/4 in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.69
Spikes, large	3.10c.
Track bolts, all sizes, per 100 count	.65 per cent off list
Machine bolts, 100 count	.65 per cent off list
Carriage bolts, 100 count	.65 per cent off list
Nuts, all styles, 100 count	.65 per cent off list
Large rivets, base per 100 lb.	\$3.80
Wire, black, soft ann'l'd, base per 100 lb.	2.90c.
Wire, galv. soft, base per 100 lb.	3.25c.
Common wire nails, per keg	2.35c.
Cement coated nails, per keg	2.35c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

\*Delivered in Pittsburgh switching district.

## CHICAGO

### Base per Lb.

Plates and structural shapes	3.20c.
Soft steel bars, rounds	3.00c.
Soft steel bars, squares and hexagons	3.15c.
Cold-fin. steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.

### Per Cent Off List

Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	.87 1/2
Cut point set screws	.75 and 10
Flat head bright wood screws	70
Spring cotters	55
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	.57 1/2
Wrought washers	\$4.50 off list
Black ann'l'd wire per 100 lb.	\$3.85
Com. wire nails, base per keg	2.95†
Cement c't'd nails, base per keg	2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

\*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

## NEW YORK

### Base per Lb.

Plates, 1/4 in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, rounds	3.31c.
Iron bars	3.31c.
Iron bars, Swed. char-coal	6.75c. to 7.00c.

Cold-fin. shafting and screw stock:

Rounds and hexagons	3.81c.
Flats and squares	3.81c.
Cold-rolled; strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheets (No. 10)	3.81c.
Hot-rolled ann'l'd sheets (No. 24*)	3.89c.
Galvanized sheets (No. 24*)	Special
Long terne sheets (No. 24)	5.25c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x 1/2 in. and larger	3.75c.
Open-hearth spring steel	4.00c. to 10.00c.
Common wire nails, base per keg	\$3.21

### Per Cent Off List

Machine bolts, square head and nut:	
All diameters	.65 and 10
Carriage bolts, cut thread:	
All diameters	.65 and 10
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

## ST. LOUIS

### Base per Lb.

Plates and struc. shapes	3.45c.
Bars, soft steel (rounds and flats)	3.25c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.40c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.30c.
Black corrug. sheets (No. 24)	4.10c.
*Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.

### Per Cent Off List

Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	70

\*No. 26 and lighter take special prices.

## PHILADELPHIA

### Base per Lb.

*Plates, 1/4-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	3.03c.
†Reinforc. steel bars, sq. twisted and deformed	2.96c.
Cold-finished steel bars	3.76c.
*Steel hoops	3.43c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.65c.
†Galvanized sheets (No. 24)	4.40c.
*Hot-rolled annealed sheets (No. 10)	3.08c.
Diam. pat. floor plates, 1/4 in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

\*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

†For less than 2000 lb.

## CLEVELAND

### Base per Lb.

Plates and struc. shapes	3.31c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.10c.
†Cold-finished steel bars	3.50c.
Flat-rolled steel under 1/4 in.	3.36c.
Cold-finished strip	†3.00c.

Hot-rolled annealed sheets

(No. 24)	3.91c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
*Black ann'l'd wire, per 100 lb.	\$2.40
*No. 9 galv. wire, per 100 lb.	2.75
*Com. wire nails, base per keg	2.35

†Outside delivery 10c. less.

\*For 5000 lb. or less.

## CINCINNATI

### Base per Lb.

Plates and struc. shapes	3.42c.
Bars, rounds, flats and angles	3.22c.
Other shapes	3.37c.
Rail steel reinfo. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.72c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	.55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg	
Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35

### Net per 100 Ft.

Seamless steel boiler tubes, 2-in.	\$20.37
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.38
4-in.	45.32

## BUFFALO

### Base per Lb.

Plates	3.38c.
Struc. shapes	3.25c.
Soft steel bars	3.05c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Rounds and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.43c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Com. wire nails, base per keg	\$3.15
Black wire, base per 100 lb. (2500-lb. lots or under)	3.50
(Over 2500 lb.)	3.40

## BOSTON

### Base per Lb.

Beams, channels, angles, tees, zeos	3.54c.
H beams and shapes	3.54c.
Plates—Sheared, tank, and univ. mill, 1/4 in. thick and heavier	3.56c.
Floor plates, diamond pattern	5.36c.
Bar and bar shapes (mild steel)	3.45c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.70c.
Tire steel	4.70c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.90c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.



## DETROIT

	Base per Lb.
Soft steel bars .....	3.09c.
Structural shapes .....	3.42c.
Plates .....	3.42c.
Floor plates .....	5.17c.
Hot-rolled annealed sheets	
(No. 24) .....	3.94c.
Hot-rolled sheets (No. 10) .....	3.14c.
Galvanized sheets (No. 24) .....	4.72c.
Bands .....	3.39c.
Hoops .....	3.39c.
†Cold-finished bars .....	3.64c.
Cold-rolled strip .....	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series) .....	5.29c.*
Bolts and nuts, in cases, 70 and 10 per cent off list	
Broken cases .....	70 per cent off

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.

\*Price applies to 1,000 lb. and over.

†With reduction in chemical extras.

\*\*0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only.

## MILWAUKEE

	Base per Lb.
Plates and structural shapes ..	3.31c.
Soft steel bars, rounds up to 8 in., flats and fillet angles ..	3.11c.
Soft steel bars, squares and hexagons ..	3.26c.
Hot-rolled strip ..	3.41c.
Hot-rolled sheets (No. 10) ..	3.16c.
Hot-rolled annealed 3/16-24 in. to 48 in. wide incl. ..	3.41c.
Hot-rolled annealed sheets (No. 24) ..	3.96c.
Galvanized sheets (No. 20) ..	4.66c.
Cold-finished steel bars ..	3.61c.
Cold-rolled strip ..	3.33c.
Structural rivets (keg lots) ..	3.86c.
Boiler rivets, cone head (keg lots) ..	3.96c.
Track spikes (keg lots) ..	3.91c.
Track bolts (keg lots) ..	4.91c.
Black annealed wire ..	3.40c.
Com. wire nails ..	2.60c.
Cement coated nails ..	2.60c.

## Per Cent Off List

Machine bolts, 1/2x6 and smaller ..	70
Larger than 1/2x6 ..	65 and 10
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots) ..	65 and 10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

## ST. PAUL

	Base per Lb.
Mild steel bars, rounds .....	3.25c.
Structural shapes .....	3.45c.
Plates .....	3.45c.
Cold-finished bars .....	4.02c.
Bands and hoops .....	3.55c.
Hot-rolled annealed sheets, No. 24 .....	3.90c.
Galvanized sheets, No. 24 .....	4.50c.
Cold-rolled sheets, No. 20 .....	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

## BALTIMORE

	Base per Lb.
*Mild steel bars .....	3.00c.
**Reinforcing bars .....	2.85c.
*Structural shapes .....	3.00c.
†Plates .....	3.00c.
†Hot-rolled sheets, No. 10 .....	3.10c.
†Hot-rolled annealed sheets, No. 24 .....	3.60c.
†Galvanized sheets, No. 24 .....	4.30c.
*Bands .....	3.20c.
*Hoops .....	3.45c.
§Cold-rolled rounds .....	3.73c.
§Cold-rolled squares, hex. and flats .....	3.73c.
Rivets .....	4.40c.
Bolts and nuts, per cent off list 60 and 10	

\*Quantity extras per size apply. †Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base: 1500 lb. to 1999 lb. add 15c. per 100 lb.; 1000 lb. to 1499 lb. add 30c.; 0 to 999 lb., add 50c.

‡25 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 24 bundles add 25c.

§Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 300 to 499 lb. add \$1.00; for 0 to 299 lb. add \$1.75; for combined order under 100 lb. add \$3.00.

\*\*For orders 4000 lb. to 9999 lb. Add 15c. per 100 lb. for orders 2000 to 3999 lb.; add 65c. for orders less than 2000 lb.

## CHATTANOOGA

	Base per Lb.
Mild steel bars .....	3.36c.
Iron bars .....	3.36c.
Reinforcing bars .....	3.36c.
Structural shapes .....	3.56c.
Plates .....	3.56c.
Hot-rolled sheets, No. 10 .....	3.36c.
Hot-rolled annealed sheets No. 24 .....	4.16c.
Galvanized sheets, No. 24 .....	4.86c.
Steel bands .....	3.61c.
Cold-finished bars .....	4.13c.

## MEMPHIS

	Base per Lb.
Mild steel bars .....	3.47c.
Shapes, bar size .....	3.47c.
Iron bars .....	3.47c.
Structural shapes .....	3.67c.
Plates .....	3.67c.
Hot-rolled sheets, No. 10 .....	3.47c.
Hot-rolled annealed sheets, No. 24 .....	4.27c.
Galvanized sheets, No. 24 .....	4.80c.
Steel bands .....	3.72c.
Cold-drawn rounds .....	3.89c.
Cold-drawn flats, squares, hexagons .....	5.89c.
Structural rivets .....	4.25c.
Bolts and nuts, per cent off list 65	
Small rivets, per cent off list 50	

## NEW ORLEANS

	Base per Lb.
Mild steel bars .....	3.35c.
Reinforcing bars .....	3.50c.
Structural shapes .....	3.55c.
Plates .....	3.55c.
Hot-rolled sheets, No. 10 .....	3.55c.
Hot-rolled annealed sheets, No. 24 .....	4.35c.
Galvanized sheets, No. 24 .....	4.95c.
Steel bands .....	3.95c.
Cold-finished steel bars .....	4.30c.
Structural rivets .....	4.25c.
Boiler rivets .....	4.25c.
Common wire nails, base per keg .....	\$2.65
Bolts and nuts, per cent off list 70	

## PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates, tank and U. M. ....	3.25c.	3.60c.	3.80c.
Shapes, standard ..	3.25c.	3.60c.	3.80c.
Soft steel bars ..	3.25c.	3.60c.	3.95c.
Reinforcing bars, f.o.b. cars dock Pacific ports ..	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24) .....	4.10c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10) .....	3.35c.	3.70c.	3.75c.
Galv. sheets (No. 24 and lighter) ..	4.50c.	4.40c.	5.00c.
Galv. sheets (No. 22 and heavier) ..	5.00c.	4.60c.	5.00c.
Cold finished steel			
Rounds ....	5.80c.	5.85c.	6.00c.
Squares and hexagons ..	7.05c.	7.10c.	7.25c.
Flats .....	7.55c.	7.60c.	8.25c.
Common wire nails—base per keg less carload ..	\$2.90	\$2.90	\$2.90

All items subject to differentials for quantity.

## REFRACTORIES PRICES

## Fire Clay Brick

## Per 1000 f.o.b. Works

High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois .....	\$45.00
High-heat duty, New Jersey ..	50.00
High-heat duty, Ohio .....	40.00
Intermediate, Pennsylvania, Maryland, Kentucky, Missouri and Illinois .....	40.00
Intermediate, New Jersey .....	43.00
Intermediate, Ohio .....	35.00
Ground fire clay, per ton .....	7.00

## Silica Brick

## Per 1000 f.o.b. Works

Pennsylvania .....	\$45.00
Chicago District .....	54.00
Birmingham .....	\$48.00 to 50.00
Silica cement per net ton .....	8.00

## Chrome Brick

## Per Net Ton

Standard f.o.b. Baltimore and Plymouth Meeting and Chester ..	\$45.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. ....	45.00

## Magnesite Brick

## Per Net Ton

Standard, f.o.b. Baltimore and Chester, Pa. ....	\$65.00
Chemically bonded, f.o.b. Baltimore .....	55.00

## Grain Magnesite

## Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks) .....	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks .....	40.00
Domestic, f.o.b. Chewelah, Wash. ....	22.00



# RAW MATERIALS PRICES

## PIG IRON

### No. 2 Foundry

F.o.b. Everett, Mass.; Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	\$20.50
Delivered Brooklyn	22.9289
Delivered Newark or Jersey City	21.9873
Delivered Philadelphia	21.3132
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	19.50
F.o.b. Jackson, Ohio	21.25
Delivered Cincinnati	20.5807
F.o.b. Duluth	20.00
F.o.b. Provo, Utah	17.50
Delivered San Francisco, Los Angeles or Seattle	22.315
F.o.b. Birmingham*	15.50

\* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point.

### Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

### Basic

F.o.b. Everett, Mass.; Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	\$20.00
Delivered Boston Switching District	20.50
Delivered Newark or Jersey City	21.4873
Delivered Philadelphia	20.8132
F.o.b. Buffalo	18.50
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	19.00
Delivered Cincinnati	20.0807
Delivered Canton, Ohio	20.3482
Delivered Mansfield, Ohio	20.8832
F.o.b. Jackson, Ohio	20.75
F.o.b. Provo, Utah	17.00
F.o.b. Birmingham	14.50

### Bessemer

F.o.b. Everett, Mass.; Bethlehem, Birdsboro and Swedeland, Pa.	\$21.50
Delivered Boston Switching District	22.00
Delivered Newark or Jersey City	22.9873
Delivered Philadelphia	22.3132
F.o.b. Buffalo and Erie, Pa., and Duluth	20.50
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Birmingham	20.00
Delivered Cincinnati	21.0807
Delivered Canton, Ohio	21.3482
Delivered Mansfield, Ohio	21.8832

### Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$24.00
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### Gray Forge

Valley or Pittsburgh furnace	\$19.00
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### Charcoal

Lake Superior furnace	\$22.00
Delivered Chicago	25.2528

### Canadian Pig Iron

Per Gross Ton	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	22.50

### Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	\$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

## FERROALLOYS

### Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Per Gross Ton	
Domestic, 80% (carload)	\$75.00

### Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$26.00
50-ton lots 3-mo. shipment	24.00
F.o.b. New Orleans	26.00

### Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads)	\$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	130.00

### Silvery Iron

Per Gross Ton	
F.o.b. Jackson, Ohio, 6.00 to 6.50%	\$22.75

For each additional 0.5% silicon up to 12%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

### Bessemer Ferrosilicon

#### F.o.b. Jackson, Ohio, Furnace

Per Gross Ton	Per Gross Ton
10.00 to 10.50%	\$27.75
10.51 to 11.00%	28.25
11.01 to 11.50%	28.75
11.51 to 12.00%	29.25
12%	30.25

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

### Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	\$1.30
Ferrotungsten, lots of 5000 lb.	1.35
Ferrotungsten, smaller lots	1.40
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.00c.
Ferrocromium, 2% carbon	16.50c. to 17.00c.
Ferrocromium, 1% carbon	17.50c. to 18.00c.
Ferrocromium, 0.10% carbon	19.50c. to 20.00c.
Ferrocromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovandium, del. per lb. contained V	\$2.70 to \$2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	\$2.50
Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$137.50
Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	142.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	\$38.00
Ton lots or less, per ton	45.50
Silico-manganese, gross ton, delivered	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	\$5 a ton higher

## ORES

### Lake Superior Ores Delivered Lower Lake Ports

Per Gross Ton	
Old range, Bessemer, 51.50%	\$4.80
Old range, non-Bessemer, 51.50%	4.65
Mesabi, Bessemer, 51.50%	4.65
Mesabi, non-Bessemer, 51.50%	4.50
High phosphorus, 51.50%	4.40

### Foreign Ore

#### C.i.f. Philadelphia or Baltimore

Per Unit	
Iron, low phos., copper free, 55 to 58% dry Spain or Algeria	10.25c.
Iron, low phos., Swedish, average, 68½% iron	10.25c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	26c.
Man., African, Indian, 44-48%	25c.
Man., African, Indian, 49-51%	26c.
Man., Brazilian, 46 to 48½%	24c.

#### Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered, nominal	16.00
Tungsten, domestic, scheelite delivered, nominal	16.00

#### Per Gross Ton

Chrome, 45% Cr <sub>2</sub> O <sub>3</sub> , lamp, c.i.f. Atlantic Seaboard (African)	\$17.50
45 to 46% Cr <sub>2</sub> O <sub>3</sub> (Turkish)	\$16.50 to 17.00
48% Cr <sub>2</sub> O <sub>3</sub> (African)	20.50
48% min. Cr <sub>2</sub> O <sub>3</sub> (Turkish)	19.25
Chrome concentrate, 50% and over Cr <sub>2</sub> O <sub>3</sub> , c.i.f. Atlantic ports	22.00
52% Cr <sub>2</sub> O <sub>3</sub> (Turkish)	21.75
48 to 49% Cr <sub>2</sub> O <sub>3</sub> (Turkish)	19.25

## FLUORSPAR

Per Net Ton	
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$18.00
Domestic, barge and rail	19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	21.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	35.00

## FUEL OIL

Per Gal.	
F.o.b. Bayonne or Baltimore, No. 3 distillate	4.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	3.87½c.
Del'd Ch'go, No. 3 industrial	5.00c.
Del'd Ch'go, No. 5 industrial	3.77c.
F.o.b. Cleveland, No. 3 distillate	6.00c.
F.o.b. Cleveland, No. 5 industrial	5.25c.

## COKE AND COAL

### Coke

Per Net Ton	
Furnace, f.o.b. Connellsville Prompt	\$3.65 to \$3.80
Foundry, f.o.b. Connellsville Prompt	4.25 to 5.75
Foundry, by - product, Chicago ovens	9.00
Foundry, by - product, del'd New England	11.50
Foundry, by - product, del'd Newark or Jersey City	9.65
Foundry, by - product, Philadelphia	9.38
Foundry, by - product, delivered Cleveland	9.75
Foundry, by - product, delivered Cincinnati	9.50
Foundry, Birmingham	6.50
Foundry, by - product, St. Louis, f.o.b. ovens	8.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

### Coal

Per Net Ton	
Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.75
Mine run coking coal, f.o.b. W. Pa.	1.90 to 2.10
Gas coal, ¼-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45



For  
*High Quality*  
**STEELS**

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# NIAGARA

BRAND

## FERRO-ALLOYS

FERRO SILICON  
ALL GRADES

FERRO CHROMIUM  
HIGH CARBON

FERRO CHROMIUM  
LOW CARBON

FERRO MANGANESE  
SILICO MANGANESE

**PITTSBURGH METALLURGICAL CO., Inc.**

NIAGARA FALLS,

N.Y.



... Awards higher at 21,315 tons, compared with 14,400 tons a week ago.

o o o

... New projects in small volume at 9480 tons, as against 16,130 tons in the previous week.

o o o

... Plate requirements total 6960 tons.

#### NORTH ATLANTIC STATES

Fort Fairfield-Presque Isle, Me., 110 tons, two bridges, to Pittsburgh-Des Moines Steel Co.

New York, 140 tons, garage for United States Treasury Department, to American Bridge Co.

New York, 335 tons, Welfare Island power plant, to Weatherly Steel Co.

Brooklyn, 1825 tons, public school No. 239, to Lehigh Structural Steel Co.

Brooklyn, 2100 tons, nurses' home for Kings County Hospital, to Ingalls Iron Works Co.

Nassau County, N. Y., 350 tons, State highway bridge, to Norton Steel Co.

Schenectady County, N. Y., 520 tons, State highway bridge, to American Bridge Co.

Jamaica, N. Y., 380 tons, Gertz Department Store, to Norton Steel Co.

Dunkirk, N. Y., 200 tons, building for Ludlum Steel Co., to Bethlehem Steel Co.

State of New Jersey, 620 tons, Shark River bridge, to Virginia Bridge Co.

Wilmerding, Pa., 200 tons, Westinghouse Memorial high school, to Pittsburgh Bridge & Iron Co.

Osceola, Pa., 210 tons, bridge, to Phoenix Bridge Co.

Garden Creek, Md., 160 tons, deck plate girder bridge for Norfolk & Western Railroad, to Virginia Bridge Co.

#### THE SOUTH

Ellis County, Tex., 135 tons, overpass, to Mosher Steel & Machinery Co.

Harris County, Tex., 115 tons, underpass, to Mosher Steel & Machinery Co.

Smith County, Tex., 140 tons, overpass, to Mosher Steel & Machinery Co.

Polk County, Tex., 135 tons, bridge, to Austin Brothers.

Panola County, Tex., 140 tons, overpass, to Austin Brothers.

Lipscomb County, Tex., 130 tons, underpass, to Mosher Steel & Machinery Co.

Kimble County, Tex., 1200 tons, bridge, to Bethlehem Steel Co.

#### CENTRAL STATES

Mansfield, Ohio, 2825 tons, warehouse for Westinghouse Electric & Mfg. Co., to American Bridge Co.

Cincinnati, 195 tons, coal bunkers for Cincinnati Gas & Electric Co., to L. Schriber & Sons Co.

Detroit, 860 tons, State highway bridge, Livernois Avenue, to American Bridge Co.

Detroit, 1625 tons, press shop for Chrysler Corp., to Jones & Laughlin Steel Corp.

South Bend, Ind., 290 tons, bridge, to Fort Pitt Bridge Works Co.

Kimmell, Ind., 210 tons, State highway bridge, to Bethlehem Steel Co.

Cook County, Ill., 425 tons, grade separation, to Mississippi Valley Structural Steel Co.

Watertown, Wis., 100 tons, hospital, to C. Hennecke.

States of North Dakota and Minnesota, 840 tons, Fargo-Moorhead bridge, to American Bridge Co.

Kansas City, Mo., 960 tons, highway bridge, East Sixty-third Street, to Kansas City Structural Co.

Clay County, Kan., 235 tons, overpass, to Missouri Valley Bridge & Iron Co.

Neosho County, Kan., 410 tons, highway bridge, to Missouri Valley Bridge & Iron Co.

#### WESTERN STATES

Pueblo, Colo., 400 tons, State highway bridge, to Minneapolis-Moline Power Implement Co.

Boulder Dam, 200 tons, diversion towers and supports, to International Derrick & Equipment Co.

Boulder City, Nev., 250 tons, supports for tunnel walkways, to an unnamed bidder.

Reno, Nev., 407 tons, two State underpasses and bridge, to Bethlehem Steel Co.

Marshfield, Ore., 100 tons, city power plant, to Northwest Equipment Co.

Oregon City, Ore., 275 tons, State undercrossing, to Poole & McGonigle.

Emeryville, Cal., 150 tons, plant for Pacific Manifold Co., to Golden Gate Iron Works.

Los Angeles, 280 tons, Horace Mann school, to Pacific Iron & Steel Co.

Los Angeles, 130 tons, tunnel ribs for Metropolitan Water District, divided between Commercial Shearing & Stamping Co. and Consolidated Steel Corp.

Los Angeles, 600 tons, two sound stages, to Bethlehem Steel Co.

Oceanside, Cal., 600 tons, State bridge over Santa Margarita River, to Virginia Bridge Co.

#### NEW STRUCTURAL STEEL PROJECTS

##### NORTH ATLANTIC STATES

Providence, R. I., 1000 tons, school.

East Hartford, Conn., 1000 tons, alterations to office building and plant of United Aircraft Corp.

Erie County, N. Y., 225 tons, State highway bridge; bids May 19.

Steuben County, N. Y., 400 tons, State highway bridge; bids May 19.

Tioga County, N. Y., 300 tons, State highway bridge; bids May 19.

Delaware County, N. Y., 475 tons, State highway bridge; bids May 19.

Philadelphia, 2000 tons, school at Twenty-fourth and Master Streets; bids May 19.

Lewisburg, Pa., 320 tons, factory building for Federal Penitentiary; bids in.

##### CENTRAL STATES

St. Joseph, Mich., 100 tons, high school.

Cleveland, 340 tons, Triskett Road bridge; Lowensohn Construction Co., contractor.

Cleveland, 400 tons, Ohio Bell Telephone exchange at Lakewood; H. F. Juergens Co., contractor.

Winton Place and Cuba, Ohio, 325 tons, two bridges for Baltimore & Ohio Railroad.

Kent, Ohio, 220 tons, highway bridge.

Toledo, Ohio, 400 tons, building for National Supply Co.

Chesapeake & Ohio Railroad, 300 tons, bridge at Brighton, Ohio; bids May 15.

Oskaloosa, Iowa, 190 tons, highway bridge.

State of Illinois, 475 tons, bridges; bids May 15.

La Grange, Ill., tonnage being estimated; post office.

Manitowoc, Wis., 200 tons, high school.

State of Minnesota, 200 tons, bridges; bids May 15.

##### WESTERN STATES

Sacramento, Cal., 467 tons, State overhead crossing at Jibboom Street; bids May 27.

Los Angeles, 458 tons, seven bridges for United States Engineers; Consolidated Steel Corp., low bidder.

Rivera, Cal., 152 tons, State undercrossing on San Gabriel Boulevard; bids May 28.

King County, Wash., 168 tons, State undercrossing at Black River Junction; general contract awarded.

State of Colorado, 100 tons, bridge; bids May 19.

##### CANADA

Vancouver, B. C., 11,000 tons, Narrows bridge on which only British steel will be used; bids expected in August.

#### FABRICATED PLATES

##### AWARDS

Harwich, Mass., 140 tons, 250,000-gal. elevated tank, to Chicago Bridge & Iron Works Co.

Buffalo, 300 tons, tanks, to Chicago Steel Tank Co.

Cincinnati, 4500 tons, 29 coal barges for Hatfield Campbell Creek Coal Co., to Bethlehem Steel Co.

Estero Bay, Cal., 1800 tons, four 118,000-bbl. oil tanks for Texas Co., to Consolidated Steel Corp.

San Francisco, 120 tons, shore pipe for United States Engineers, to Pacific Coast Engineering Co.

Astoria, Ore., 100 tons, shore pipe, to Puget Sound Machinery Depot.

##### SHEET PILING

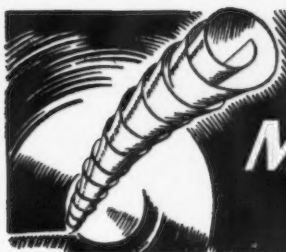
##### AWARDS

State of California, 150 tons, All-American Canal, to Jones & Laughlin Steel Corp.

##### NEW PROJECTS

Los Angeles, 125 tons for Treasury Department; Bethlehem Steel Co., low bidder.





## THIS WEEK'S MACHINE TOOL ACTIVITIES

... *Farm implement makers may soon go on "assembly line" basis.*

o o o

... *Order anticipation is essential to delivery.*

o o o

... *Depression grip on machine tools is broken through increased efficiency.*

o o

By L. M. WAITE

o o

THE present phase of the machine tool cycle points definitely to approaching release from the final grip of depression conditions. Territorial reports are of premiums offered for preferred machine sizes and quick deliveries.

Similar delivery drives, after other determined machine betterment periods, have always included rush offers to pay overtime costs to hasten shipments. They have likewise included the sending of engineers and transportation men to builders' plants to guard against loss of time and to adopt any measures necessary to save a day or so which might otherwise be lost to production.

It is history that for months, preceding this delivery phase of the cycle, machine tool distributors warned against order delays; that orders become abundant; labor shortages occur, though causes may vary; and that the machine tool industry then settles down to its supply-role in the economic scheme of cost reductions.

### **Metropolitan**

Dealers and direct representatives have followed their Detroit brethren in taking on worries as intermediaries between machine tool buyers and machine tool builders in matters of delivery. One prominent dealer, in commenting, states that he has 11 individual-order machines of one type which are late on delivery. He states that this number is greater than his total orders for the type over a period of five years preceding Nov. 1, 1935.

The week has produced orders for a number of big machines involving special features. There is no noticeable reduction in inquiry interest. One of the larger steel companies has entered the delivery arena for a number of standard machines and several machines for special work.

### **Chicago**

The Rock Island shops at Silvas, Ill., are very busy and are working on a list for appropriation purposes which indicates that it is badly in need of new equipment. Other railroads are quiet, though it has been indicated that the Chicago & North Western would like to buy additional shop equipment, if it could arrange financing. A. O. Sith Corp., Milwaukee, has sold off considerable old equipment but there is no indication of its making new purchases. Harnischfeger Corp., Milwaukee, has bought some second hand machinery for an all-steel house on which it is planning. The farm implement industry is now coming to realize that it must go on a real production basis. Heretofore it has been more or less of a semi-production plan but that is not keeping up with demand and the need is now recognized for special equipment for real line production. It may take some time to develop these plans but the prospects for machinery sales to farm implement manufacturers are excellent.

A prominent Mid-Western builder of production equipments negotiated a March order for an impressive number of machines on a delivery

basis which is proving to be of all-around advantage. Shipments are at the makers convenience, by units, at any time after four months, with completed delivery within six months.

### **Cleveland**

Demand for automatic screw machines, after showing decreased activity for a few weeks, has taken quite a spurt and a leading manufacturer cannot promise deliveries until July on most sizes. Miscellaneous orders for turret lathes continue good, the demand at present being more for the heavier types of machines. Most of the business is for replacement purposes. Business in press equipment is good, orders being mostly for medium sized machines. Business is coming from the automobile, refrigerator and stove manufacturers. A leading manufacturer sold more presses in April than in any previous month since the depression. The Babcock & Wilcox Co. is buying considerable miscellaneous machine tool equipment for its Barberton, Ohio, plant.

### **Detroit**

There are still enough proposals out for equipment on automotive lines to expect a rather active machinery market during both May and June. Whereas it appeared earlier that a great deal of the motor line equipment would have been closed by this time, there is still enough business not yet placed to make the immediate future rather attractive. Although some dealers report a falling-off in orders for the first week in May, others present counteracting stories.

### **Cincinnati**

The advent of warm weather has brought signs of relaxing interest in the machine tool business. While the total bookings were almost equal to the preceding period, some manufacturers indicate a lessened demand. Drilling machinery is noticeably quiet after a period of fair activity, but other tools reflect only moderate fluctuations. Milling machine and grinders are stronger under impetus of increased automobile buying.

### **Birmingham**

Dealers in this Southern area have recently developed some turret lathe business for a Mid-Western builder. This fact offers new-tool encouragement as the territory has been somewhat backward in taking on new tools when fair-conditioned used equipment has been available.

# PLANT EXPANSION AND EQUIPMENT BUYING



... **Standard Oil Co. of Indiana** is arranging fund of \$10,000,000 for expansion in oil refineries in Mid-West and Southern districts. Company is also planning oil drilling operations in its oil fields to cost about \$16,000,000.

o o o

... **Illinois Zinc Co., Chicago**, will spend about \$300,000 for new smelting plant near Amarillo, Texas.

o o o

... **Shell Petroleum Corp.** plans expansion at oil refinery at Houston, Texas, to cost about \$2,500,000.

## ◀ NORTH ATLANTIC ▶

**Department of Parks**, Arsenal Building, Central Park, New York, has filed plans for one-story boat and marine repair shop, 80 x 110 ft., at Randall's Island Park, opposite East 125th Street. Cost about \$75,000 with equipment. Aymar Embury, 2d, 150 East Sixty-first Street, is architect.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until May 19 for two electric trucks with electric batteries, two trucks without batteries and for two battery units for Brooklyn Navy Yard (Schedule 7851); until May 26, insulated electric cable for Brooklyn and Mare Island yards (Schedule 7819).

**Gardner Displays, Inc.**, 215 East Thirty-seventh Street, New York, manufacturer of electric displays, signs, advertising floats, etc., has leased one-story building at Van Alst and Forty-third Avenues, Long Island City, for new plant.

**Semet-Solvay Co.**, 40 Rector Street, New York, manufacturer of chemical products, protective paints, etc., plans one-story addition to plant at Solvay, N. Y. Cost over \$50,000 with equipment.

**Superintendent of Lighthouses**, St. George, Staten Island, New York, asks bids until May 25 for 38 steel gas buoys of nine different types, from 9 ft. diameter and 39 ft. long, to 5 ft. diameter and 15 ft. long; with skeleton lantern towers and bottom counterweights, some with bells or gongs, four bell buoys, three gong buoys; also for 67 unlighted special class buoys of welded steel construction.

**Signal Corps Procurement District**, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until May 18 for junction boxes, mountings, etc. (Circular 216), control boxes (Circular 210); until May 25, 400 generators (Circular 207), control boxes (Circular 209).

**Commanding Officer**, Picatinny Arsenal, Dover, N. J., asks bids until May 19 for one special drilling machine (Circular 374).

**Board of Education**, Twenty-first Street and Parkway, Philadelphia, plans manual training department in new three-story junior high school at Twenty-third, Twenty-fourth, Master and Seybert Streets, for

which bids are being asked on general contract until May 20. Cost close to \$1,000,000. Irwin T. Catherine is architect for board.

**Commanding Officer**, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until May 18 for 18,536 silicon bronze die-castings, high-pressure, for H.E. shells (Circular 456), for reworking metals into 30,000 lb., annealed gilding metal for bullet jackets (Circular 467).

**Quartermaster Depot**, Twenty-first and Johnson Streets, Philadelphia, asks bids until May 20 for one motor-driven centrifugal pump with accessories (Circular 268).

## ◀ NEW ENGLAND ▶

**Commanding Officer**, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until May 19 for 10 hand milling machines, two milling machine attachments, 30 arbors and 10 adapters (Circular 222).

**Cooper Oven Thermometer Co.**, Pequabuck, Conn., manufacturer of measuring instruments, thermometers, parts, etc., has plans for two-story addition, 40 x 165 ft. Cost over \$45,000 with equipment. Erection will be carried out under supervision of Benjamin R. Lockwood, Cambridge Road, Bristol, Conn. H. A. Hayden, Bristol, is architect.

**Pitney Bowes Postage Meter Co.**, Pacific Street, Stamford, Conn., manufacturer of machines for affixing postage stamps, parts, etc., has plans for two-story addition. Cost close to \$50,000 with equipment. H. Chapman, 95 Hope Street, is architect.

**American Brass Co.**, 131 Dorrance Street, Providence, R. I., with main plant at Waterbury, Conn., will soon take bids for one-story addition to Providence branch, for storage and distribution. Cost over \$30,000 with equipment. J. Peter Geddes, Hospital Trust Building, Providence, is architect.

## ◀ WESTERN PA. DIST. ▶

**Hamburger Distillery, Inc.**, Brownsville, Pa., has plans for one-story fermentation

building, with battery of 30 steel tanks, each 50,000 gal. capacity; mechanical bottling works; four multi-story storage and distributing buildings; addition to steam power plant and other structures. Cost close to \$200,000 with equipment. G. E. Hough is general superintendent.

**Keystone Public Service Co.**, Oil City, Pa., has approved plans for extensions and improvements in steam-operated electric generating plant, including new equipment. Cost about \$350,000 with equipment.

## ◀ SOUTH ATLANTIC ▶

**Terrell Machine Co.**, North Church Street, Charlotte, N. C., manufacturer of textile machinery and parts, has acquired plant and business of Piedmont Sundries Co., Mint and Palmer Streets, manufacturer of spindles and other textile machinery parts, and will consolidate. Last noted plant will be continued as a branch factory and increased production carried out.

**United States Engineer Office**, Jacksonville, Fla., asks bids until May 19 for one cast steel runner, complete with all liners (Circular 304).

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until May 22 for spare parts for airplanes for Pensacola, Fla., Navy Yard (Schedule 900-9567).

## ◀ OHIO AND INDIANA ▶

**Delco Brake Co.**, 1440 Wisconsin Boulevard, Dayton, Ohio, manufacturer of automobile brakes and equipment, has let general contract to Charles H. Shook, Inc., 582 West Second Street, for one-story addition, part of unit to be used for development and experimental work. Cost close to \$50,000 with equipment.

**Gas Machinery Co.**, Waterloo Road and East 161st Street, Cleveland, manufacturer of scrubbing, washing, purifying and other machinery for gas plants, has let general contract to Dunbar Co., 8201 Cedar Street, for one-story addition. Cost close to \$30,000 with equipment.

**Contracting Officer**, Material Division, Air Corps, Wright Field, Dayton, asks bids until May 20 for 500 generator terminal housing assemblies, 500 generator housing commutator end plugs, 600 generator field ring plugs, 700 generator terminal screws and 1200 generator terminal grounding jumpers (Circular 816), wind indicator control assembly (Circular 812); until May 22, 2100 compass assemblies (Circular 822), two field strength meters (Circular 819); until May 27, 10 power hacksaws, complete with motors and accessories (Circular 827).

**Lever Brothers Co.**, Hammond, Ind., manufacturer of soaps, edible oils and kindred products, has asked bids on general contract for three additions, each one-story, 80 x 250 ft., 66 x 252 ft., and 48 x 62 ft. Cost about \$500,000 with equipment. Stone & Webster Engineering Corp., 49 Federal Street, Boston, is consulting engineer. Company headquarters are at Cambridge, Mass.

**Muehlhausen Spring Co.**, Logansport, Ind., manufacturer of mechanical springs, has let general contract to Arthur J. Wolf Construction Co., Logansport, for one-story and basement addition, 80 x 150 ft., to cost \$75,000 with equipment.

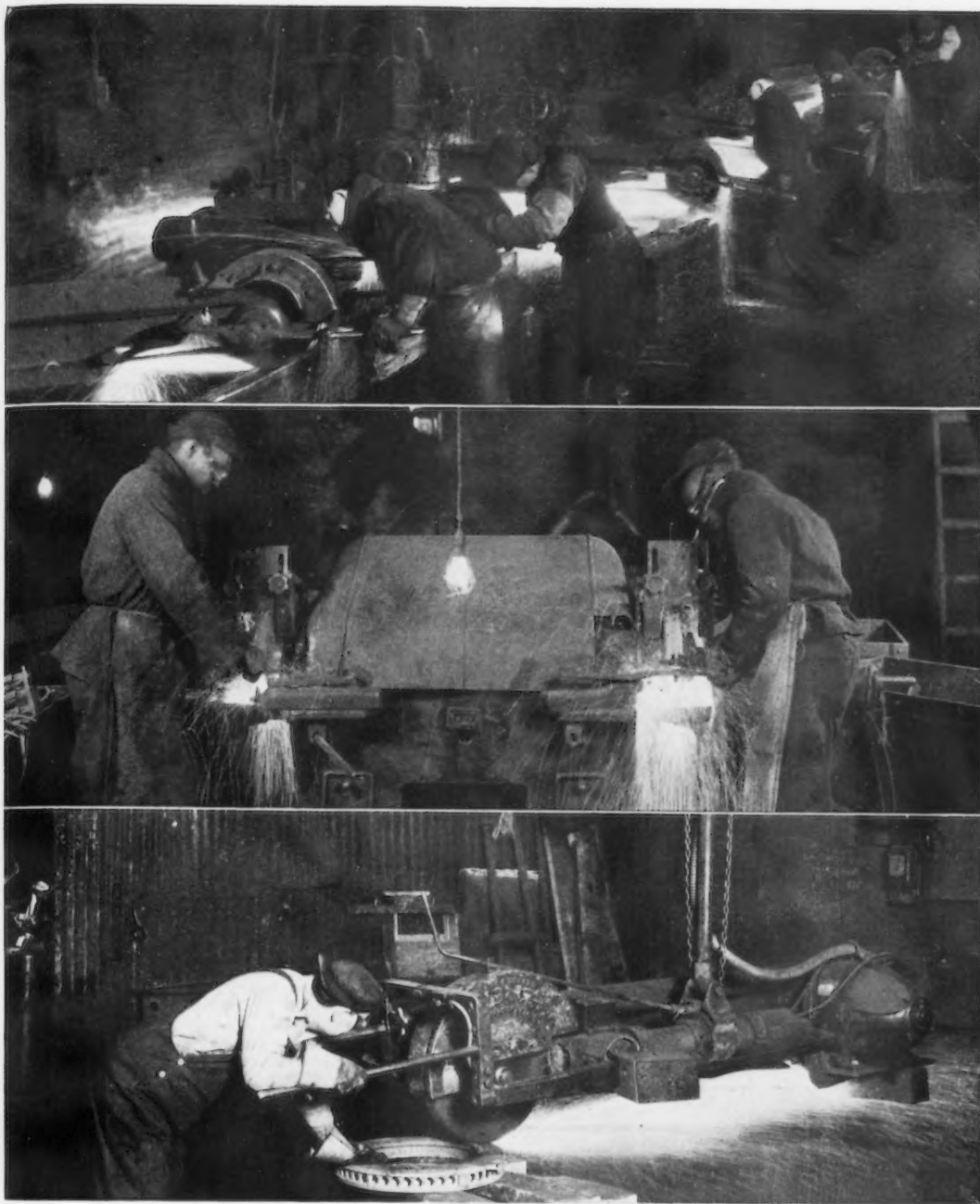
## ◀ SOUTHWEST ▶

**Shell Petroleum Corp.**, Shell Building, St. Louis, plans new buildings and equipment at oil refinery on Houston ship channel, Houston, Tex., to increase capacity from 56,000 to 76,000 bbl. crude oil per day. Similar extensions will be carried out in storage and distributing department, with installation of steel tanks and other equipment. Cost about \$2,500,000.

**Continental Oil Co.**, Ponca City, Okla., plans two pumping plants at Genesee and Moundridge, Kan., for booster service for new welded steel pipe line from first noted point to oil refinery at Ponca City. Cost over \$150,000 with equipment. R. T. Looney, first noted address, is company engineer.

**Southern Equipment Co.**, 5017 South Thirty-eighth Street, St. Louis, manufac-





**M**ACKLIN GRINDING WHEELS are widely and efficiently used on all types of foundry jobs. When floor stands and swing frame grinders are Macklin equipped production runs smoothly and economically as Macklin Wheels cut fast and easily.

**PROTECT *your* PRODUCTION**

**MACKLIN COMPANY, JACKSON, MICHIGAN, U.S.A.**

*Manufacturers of Grinding Wheels*

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K  
L  
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N**



turer of metal lunch room equipment, containers, etc., has let general contract to Webb-Boone Co., 5103 Fyler Avenue, for one-story addition, 40 x 150 ft. Cost over \$50,000 with equipment.

**State Building Commission**, Capitol Building, Jefferson City, Mo., Edgar M. Eagan, executive secretary, will soon take bids for two new industrial shops at State penitentiary in Cole County, each about 150 x 200 ft. Cost \$200,000 with equipment. Alonz H. Gentry, Voskamp & Neville, Inc., 4 West Thirteenth Street, Kansas City, Mo., is architect; Charles A. Haskins, Finance Building, Kansas City, is supervising engineer.

**Illinois Zinc Co.**, 302 South Michigan Avenue, Chicago, has acquired property near Amarillo, Tex., for new smelting plant, to be equipped to use natural gas as fuel. It is scheduled for completion next fall. Cost about \$300,000 with equipment.

## ◀ BUFFALO DISTRICT ▶

**Dunkirk Radiator Corp.**, Middle Road, Dunkirk, N. Y., manufacturer of steam and hot water radiators, parts, etc., has approved plans for one-story addition, about 50 x 200 ft. Cost over \$45,000 with equipment.

**Eastman Kodak Co.**, Kodak Park, Rochester, N. Y., has let general contract to Ridge Construction Co., Rochester, for two one and five-story additions, 60 x 145 ft., and 120 x 565 ft., respectively, last noted for processed paper-manufacturing unit; also for five-story addition to Hawk-Eye Works, St. Paul Street, 40 x 160 ft., for production of precision and other photographic equipment. Cost \$1,100,000 with equipment.

## ◀ WASHINGTON DIST. ▶

**Purchasing and Contracting Officer**, Holabird Quartermaster Depot, Baltimore, asks bids until May 29 for air compressors, turning and grinding machines, pedestal grinders, drill presses, engine lathes, arc welding equipment, power hacksaws, gasoline tanks, exhaust fans, grinding set reseater, etc. (Circular 147).

**Board of District Commissioners**, District Building, Washington, asks bids until May 19 for iron fixtures and fittings for top of

lamp posts; until May 22, one portable air compressor mounted on truck.

**Eastern Shore Public Service Co.**, Salisbury, Md., plans extensions and improvements in power plants and system, including new power equipment, transmission and distributing lines, power substations and switching stations, service facilities, etc. Fund of about \$700,000 is being arranged for work.

**Chemical Warfare Service**, Edgewood Arsenal, Md., asks bids until May 18 for 10 blasting machines (Circular 88).

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until May 19 for carbon and high-speed twist drills (Schedule 7814), seamless copper tubing (Schedule 7871); until May 22, ratchet braces, breast and ratchet drills (Schedule 7858) for Eastern and Western navy yards.

## ◀ SOUTH CENTRAL ▶

**United Gas System, Inc.**, Rusk Building, Houston, Tex., plans extensions and improvements in gasoline refinery at Myrtis in Rodessa, La., oil field district, with installation of new absorption equipment and other machinery for increase in capacity. Additions will also be made to gas booster plants and additional equipment installed. Cost over \$600,000 with machinery.

**United States Engineer Office**, Vicksburg, Miss., asks bids until June 2 for one steam-engine driven electric generating set, marine type (Circular 260); until June 3, two steel hull motor boats (Circular 263); until June 4, cast bronze bushings (Circular 266).

**Town Council**, Belmont, Miss., asks bids until May 27 for pumping machinery and accessories, elevated steel tank and tower, and miscellaneous equipment for municipal water system. Totten & Loving, Atlanta, Ga., are consulting engineers.

**Director of Purchases**, Tennessee Valley Authority, Knoxville, Tenn., asks bids until May 18 for load frequency control equipment for hydroelectric power plants at Norris, Wheeler and Wilson dams.

## ◀ MICHIGAN DISTRICT ▶

**Electric Auto-Lite Co.**, Champlain and Mulberry Streets, Toledo, Ohio, is negotiating with Chamber of Commerce, Bay City, Mich., for acquisition of former factory of

Wildman Rubber Co. for new branch plant for manufacture of automobile parts. Structure will be remodeled, and new equipment installed. Cost about \$125,000 with machinery.

**Grand Rapids Varnish Corp.**, Grand Rapids, Mich., has authorized additions to plant on Steele Avenue comprising one-story unit for special enamel production, one-story addition to lacquer works, to cost about \$75,000 and \$100,000 with equipment, in order noted, and several other one and multi-story buildings. General contract for first-mentioned building has been let to Barnes Brothers Construction Co., Grand Rapids, and awards for other units will be made soon. Project will cost close to \$1,000,000, including about \$450,000 for equipment. Harry L. Mead, Grand Rapids, is architect. Grand Rapids Paint & Enamel Co., a subsidiary, is taking over a plant unit on Godfrey Avenue, and will carry out expansion at that location.

**Standard Fuel Engineering Co.**, 667 Post Avenue, South, Detroit, manufacturer of industrial furnaces and high temperature refractories, has started construction of a plant addition which will increase its floor space one-third.

## ◀ MIDDLE WEST ▶

**Standard Oil Co. of Indiana, Inc.**, 910 South Michigan Avenue, Chicago, is arranging fund of about \$10,000,000 for expansion and improvements in oil refineries in Middle West and Southern districts, including new equipment. A gasoline refinery is planned at Texas City, Tex.; also a new catalytic polymerization unit. Entire project will be carried out this year. Company also is planning oil drilling operations at its various oil fields to cost about \$16,000,000.

**Acme Industrial Co.**, 413 North Carpenter Street, Chicago, manufacturer of die-maker's equipment and supplies, will soon ask bids on general contract for new one-story plant at Union and Lake Streets, 150 x 150 ft., with foundations for two additional stories later. Cost close to \$100,000 with equipment. Company will remove present works to new location and increase capacity. Alfred S. Alschuler, 28 East Jackson Boulevard, is architect.

**Quartermaster**, Fort Omaha, Omaha, Neb., asks bids until May 18 for eight portable steel steam boilers, oil-burning type, complete with oil burners and accessories (Circular 16).

**Iowa-Nebraska Light & Power Co.**, Lincoln, Neb., has approved plans for extensions and improvements in steam-operated electric power plant at Red Oak, Iowa, including new equipment. Cost over \$200,000 with equipment.

**City Council**, Madison, Minn., asks bids until May 25 for new boiler unit and auxiliary equipment for municipal power plant. Perkins & McWayne, Sioux Falls, S. D., are consulting engineers.

## ◀ PACIFIC COAST ▶

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until May 19 for one 6000-lb. electric hoist, with plain trolley, and one similar hoist, with forged steel hook suspensions, for San Pedro, Cal., Naval Station (Schedule 7886), two electric lift trucks and one storage battery, and two electric platform trucks and one storage battery for Puget Sound Navy Yard (Schedule 7824); until May 22, 2880 liquid sprayers for Mare Island and Eastern yards (Schedule 7846); until May 29, spare parts for airplanes for San Diego yard (Schedule 900-9575).

**Del Rio Winery**, Woodbridge, San Joaquin County, Cal., will soon take bids on general contract for new plant, comprising several one-story units for distillery, fermenting building, storage and distribution and other service, including power house. Cost about \$140,000, of which equipment will represent close to \$90,000. E. G. Ernst, 9 West Cleveland Street, Stockton, Cal., is architect.

**Pacific Oil & Meal Co.**, Long Beach, Cal., has let general contract to Western Engineering Co., Chamber of Commerce Building, Los Angeles, for two new multi-story plant units, 110 x 120 ft., and 100 x 150 ft., latter for storage and distribution, and several smaller buildings. Cost about \$175,000 with machinery.

# MURCHEY TYPE "C" COLLAPSIBLE TAP

VISUALIZE  
THE FOLLOWING FEATURES:

1. Chasers move in hardened slots.
2. Chasers collapse positively by cam and rollers.
3. Chasers quickly removed for

grinding and quickly reset without removing cap.

4. Tap can be used for stationary and rotating tapping.

**MURCHEY MACHINE & TOOL CO.,**

951 Porter St.,  
Detroit, Mich.

Collapsible Taps, Self-Opening Die Heads; Bolt Threading, Pipe Threading, and Pipe Cutting-Off Machinery.

# YARDSTICK



## National Acme Automatics Set New Production Records

**I**N MANY PLANTS the production rate on automatic screw machines has been practically uniform for years. But the introduction of the new National Acme Model R is making old standards obsolete. A new, longer yardstick is needed.

Look, for example, at what happened at an automotive parts plant in the middle west.\* A typical operation is the manufacture of gear blanks. It is a ticklish job. Tough on tools. The material is SAE 4640 (high carbon molybdenum steel.)

On a new National Acme machine the production rate is  $2\frac{1}{3}$  times that of old-style machines! Tool life is materially lengthened. Down-time cut to almost nothing. So now they have a new yardstick for measuring production.

If you are using screw machines bought in the twen-

\*Name on request.

ties, perhaps we can save money for you, too. We will be glad to study your requirements, give you actual figures on costs, machine rates and savings on any of your operations.

**The National Acme Company, Cleveland, O.**

**"There's No Obsolete Equipment in Our Plant!"**

Are you sure, Mr. Executive?

Have you heard the whole story of modern screw machines within the last year? If not, you may be surprised at some of the new developments. We've put in machines that have paid for themselves in a year. Can we do the same thing for you?

# ACME

GRIDLEY AUTOMATICS



★Smooth acceleration and deceleration

★Accurate Stepless Speed Control  
... Minimum to Maximum in either direction

★Automatic Load Indication and Overload Protection

★Flexible Location with Hand, Automatic or Remote Control

★High Efficiency, Low Maintenance

★Smaller Size, Lower Cost



## "Simply Amazing Control"

USER after user finds that the New Oilgear *Fluid Power* Variable Speed Transmission gives startling results in accuracy, ease and stepless variation of speed control. The new simple design brings exceptional compactness, higher speeds and wide usefulness at lower cost. Altogether, Oilgear is the most talked-about development in the transmission field. Be sure you know all about it. Write today for Bulletin 60000. THE OILGEAR COMPANY, 1311 W. Bruce Street, Milwaukee, Wisconsin.



## OILGEAR *Fluid Power* VARIABLE SPEED TRANSMISSIONS

### Eye Appeal in Machinery Design and Finish

(CONTINUED FROM PAGE 53)

psychological values. Colors that are strong in chroma and light in shade give an illusion of increased size to the objects coated. Dark

colors make the coated objects seem smaller. Colors also affect apparent weight. Orange, red and black are the "heavy" colors and objects finished with them appear to weigh more than the same objects finished in the "light weight" colors, i.e., yellow, blue and green.

It is impossible in a short article of this type to cover the subject of proper design and color adequately. The best that can be

hoped for is to call a manufacturer's attention to the existence of the problem, and to outline the points that must be considered in its solution. If the nature of the product, market, and size of the manufacturer warrant it, a professional product designer should be consulted. Most reputable manufacturers of finishing materials have on their staffs one or more designers who have made a special study of the psychological effects of color, while a few progressive finishing-material manufacturers have even gone so far as to employ technicians who understand the basic principles of structural product design from the eye-appeal angle. Such men are always glad to cooperate with the product manufacturer.

However, much can be done by the manufacturer himself if he will give sufficient thought and study to the problem of building eye-appeal (which is really sales-appeal) into his product.

### Buick Favors Combined Operations in Special-Purpose Machines

(CONTINUED FROM PAGE 49)

On the rear of the machine are also three separate heads, one of them horizontal and the other two at an angle. The rear horizontal and lower angular units are similar in construction and each contains a single spindle, one used for drilling and the other for countersinking. The top rear angular unit is a standard tapping unit combining lead screw and nut and reversing motor drive with magnetic brake. Control of the entire machine is through a single push-button station and in addition, every unit has independent push-button control. At each indexing of the trunnion fixture, one finished piece comes off the machine, a semi-finished casting is removed from the radial fixture, and placed on the side fixture, and a new casting is loaded. The output is 75 finished castings per hour.

The only remaining operations are to mill the face of the countershaft lock box in a small hand miller and to spotface at the same point in a hand drill.